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ORIGINAL COMMUNICATIONS.

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ON SO-CALLED "MULTIPLE OSTEOMATA" OF THE TRACHEAL MUCOUS MEMBRANE.*

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The growth of bone in the mucous membrane of the trachea is a matter of pathological rather than of clinical interest. It invites consideration both from its rarity and from its presenting some unusual features in bone formation.

Von Bruns,¹ in his review of new growths of the larynx and trachea, was able in 1898 to gather from the literature one hundred and forty-seven cases of tracheal tumors, of which one hundred and two were benign; amongst these he classified twenty-eight under the heading of "enchondromata and chondro-osteomata."

The most recent review of the subject is to be found in an article by Moltrecht,² published in 1902, with a table of thirty-two cases.

To this number I am able to add ten from the literature, and have also two cases to report as autopsy findings, one from the Pathological-Anatomical Institute of the Allgemeines Staetisches Krankenhaus in Friedrichshain, Berlin, and one from the Pathological Museum of McGill University.

REVIEW OF REPORTED CASES.

Wilks,³ of London, was the first to report a case. In 1857 he described the condition in a man of thirty-eight, who had died of

*From the Pathological Laboratory of the Allgemeines Staetisches Krankenhaus, Friedrichshain, Berlin. Prosector, Prof. Dr. Ludwig Peck.

pulmonary tuberculosis; the whole surface of the larynx, trachea and bronchi was covered with numerous small bony plates.

Virchow,⁴ referred to the growths in his lectures in 1863, and mentioned a case of his own. Five years later Steudner,⁵ described "heteroplastic miliary osteomata of the tracheal mucosa."

H. Chiari⁶ reported a case in 1878. He drew attention to the fact that Rokitansky had recognized the condition as early as 1855. In the latter's collection (in the Vienna Anatomical-Pathological Museum) is a specimen with the inscription, "Trachea.... obsidetur numerosis....ossiculis in textu submucoso evolutis."

Solis Cohen⁷ reported a case as presenting multiple ecchondromata of the anterior wall of the trachea; he did not report the presence of bone.

The first to demonstrate a direct connection between the new formed bone and the normal cartilage, was Eppinger.⁸ He found a bridge of irregular cartilaginous structure.

Ganghofner⁹ and O. Chiari¹⁰ met with ecchondroses and isolated cartilaginous nodules in association with chronic inflammatory processes. The former's case is of this special interest, that it was one of the earliest cases of scleroma upon which microscopical examination was made.

In the last twenty years the cases multiply.

Dennig¹¹ reported two in 1888, R. Heymann¹² one in the following year, and Hammer¹³ a series of seven in 1890. Mischaikoff¹⁴ published an inaugural dissertation upon this subject in 1894 from Ribbert's laboratory in Zurich; to this dissertation we will have occasion to refer again.

The late Professor von Schroetter¹⁵ was the first to diagnose the condition clinically. In his lectures on the diseases of the trachea, he reported a case that had been under observation for twenty years.

Birch-Hirschfeld¹⁶ in 1898 reported a case in which the small bone nodules lay on the *posterior* surface of the trachea. And in the same year von Recklinghausen¹⁷ reported a case where both larynx and trachea were involved.

Cases in which the condition was found clinically have been reported by H. Von Schoetter,¹⁸ Law,¹⁹ Moritz Schmidt²⁰ and Mann.²¹ As a post-mortem finding, we have it reported by Hueter,²² Moltrecht, Rode,²³ and Mann.

The ten cases, which are not included in Moltrecht's series, are those of Virchow, L. von Schroetter (*loc. cit.*, two cases), Birch-

Hirschfeld, Moritz Schmidt, Law, Rode, Ziegler,²⁴ and Mann (two cases).

My own two cases bring the total number to forty-four. The first was a young man of twenty-eight years, who was admitted to the Friedrichshain Hospital, Berlin, on June 29th, 1908, suffering from bilateral lobar pneumonia. He died the following day. At the autopsy, performed by Prosector Dr. Pick on July 1st, were found bilateral lobar pneumonia, bronchitis, adenoma of the left lobe of the thyroid.

The second case was an elderly man, who died in the Montreal General Hospital in December, 1900, of trauma to the brain substance, fractured femur, and pulmonary emphysema. The trachea was found at the post-mortem examination to be studded with nodules of cartilage and bone, and was sent to the Pathological Museum of the Medical Faculty of McGill University. Detailed descriptions follow below.

In both cases the condition was an accidental post-mortem finding.

CLINICAL POINTS.

The subject is not without importance clinically. From the reports of the five cases where the diagnosis was made *intra vitam*, I have gathered the following facts.

Associated conditions, observed in one or more of the patients, were rhinitis atrophica, anosmia, crust-formation in pharynx and larynx, chronic bronchitis. Several cases had laryngeal symptoms, rawness or hoarseness of voice, attacks of coughing provoked by laughing; two complained of a sensation of a "foreign body in the throat," and one of feeling of compression at the level of the manubrium sterni.

H. von Schroetter's case complained of gradually increasing difficulty in breathing. Here operative treatment was in a measure successful. The writer reports that he was able to remove a bony mass from the level of the eighth ring.

One of the tumors in Mann's patient arose just below the anterior commissure, and prevented closure of the glottis. Owing to its bony hardness and its anatomical relations, the attempts at its removal failed.

Where the condition was discovered at autopsy, the writers agree in saying that there was no history of symptoms which could be ascribed to it.

The ages of the patients vary greatly. Rode's case was a girl of twelve, and the others were adults from the third to the eighth decade.

The causes of death do not admit of generalizations or classifications. In the majority of the cases, the chief cause of death lay elsewhere than in the respiratory system; but we find eight of the cases died of pulmonary tuberculosis, four of pneumonia and one of perichondritis of the larynx.

L. von Schroetter and H. von Schroetter give in their articles pictures of the condition as observed in the laryngeal mirror.

Moltrecht gives three stereoscopic X-ray photographs of his preparations.

In connection with the diagnosis of the condition by direct tracheoscopy, interesting points are brought up by Law (loc. cit.) and von Eicken.²⁵

VIEWS OF PATHOLOGISTS.

Different writers seek in different ways to explain the origin of the abnormal cartilage and bone. Some regard the growths as inflammatory, others as developmental.

In O. Chiari's and Ganghofner's cases, the nodules were found in association with scleroma of the trachea. Ziegler accepts the chronic inflammations as the chief factor; and in his text-book he shows a section of a trachea, where new-formed bone and tuberculous granulation tissue lie side by side in the submucous layer.

Demme²⁶ found calcareous plaques on the inner surface of the trachea in cases where a struma caused tracheal stenosis. It is doubtful, however, if these plaques were bone plates.

To be contrasted with the above are the views of Virchow and Ribbert.

Virchow taught that the plates of cartilage sprang from the normal perichondrium; and that, with later development, they gradually became pediculated and finally the cartilage underwent ossification.

Ribbert went further and regarded the masses as tissues developed from misplaced embryonal tissue. His pupil, Mischaikoff, elaborated this theory in his dissertation, and not long after Ribbert himself²⁷ restated it. That in the embryo there occurred an abnormal outgrowing or an abnormal deposition of that tissue, which forms the tracheal rings; that as a result the tissue wanders into the mucous membrane, and that from it arises cartilage in greater or less extent, and from the cartilage arises bone.

Moltrecht lays stress upon the presence of elastic fibers in the new-formed cartilage.

He points out that such fibers are absent from the cartilage of the tracheal rings, but occur normally in abundance in the neighborhood of the annular ligaments and in the subepithelial tissues.

He interprets these facts as signs that there has taken place a localized metaplasia of connective tissue into cartilage, with the inclusion (in the process) of the elastic fibers in the new-formed tissue.

That is to say, he believes that we have to do with tumors which have arisen from connective tissue by metaplasia (*auf metaplastischem Wege*).

Examination of the trachea and of the sections will help us to judge the validity of these theories.

Ribbert's teaching is followed by all later writers. (See Borst,²⁸ Suchanek.²⁹)

PRESENT CASES: MACROSCOPIC DESCRIPTION.

The trachea of the first of my two cases, which has been opened in the usual way along the membranous portion, presents a striking appearance. Its lumen is encroached upon at three levels. The uppermost projection of its wall is on the left side, and reaches from the second to the eighth cartilages; it is an even swelling apparently due to the pressure of the thyroid adenoma, and calls for no further comment. The second is on the right side, and reaches from the eighth to the tenth rings; it is circular in outline, and its center rises about 3 mm. above the surrounding mucosa; it is made up of about a dozen small bony growths, of which the largest is about the size of a grain of rice. The third is the largest projection; it is on the left side, and extends from the eighth ring, beyond the bifurcation to the fourth ring of the left bronchus. It is an almost unbroken series of groups of bony growths, and in places the groups have coalesced into bony plates. One plate reaches from the fourteenth tracheal ring to the fourth bronchial, and from the outer ends of the cartilages almost to the mid-line of the front wall; it is elevated 2-4 mm. above the normal level of the epithelium. Its surface is fairly smooth, but with deep depressions which, as Dennig pointed out, represent the openings of the mucous glands. The color of the plate is greyish, and of the depressions deep red.

The entrance to the right bronchus is a stiff arch; here the mucous membrane is studded with small isolated nodules. Across the crest between the bronchi lies a group of similar nodules.

Elsewhere in the trachea there are very numerous tiny nodules from the size of a pin-head to that of a grain of rice.

The larynx is free; the membranous portion of the trachea is free; and the lower parts of the bronchi are free.

The tongue, the larynx and the trachea with the bronchial roots have been preserved by Dr. Pick after his own method in their natural colors. (See Berlin Klin. Wochenschr. 1899).

Sections for microscopic examination were cut from the right wall near the bifurcation. These were decalcified with nitric acid and embedded some in paraffin, some in celloidin; from the latter were cut serial sections. The stains employed were haematoxylin-eosin, haematoxylin—van Gieson, and Weigert—van Gieson.

In my second case the departure from the normal was much less marked. Three hard masses of fairly large size lie in the upper part of the trachea, and at the entrance to the right and left bronchi; each of them covers three rings. They project into the lumen of the tube, but not enough to cause serious stenosis. Half a dozen smaller, wart-like knobs lie opposite single cartilages of the trachea and the right bronchus. Their epithelial covering is thin, but apparently intact.

The larynx and the membranous trachea are free.

Sections were cut from one of the small masses in the right bronchus, but do not offer so clear-cut a picture as do those of the Berlin case.

A detailed description of the microscopical findings in the first case follows below.

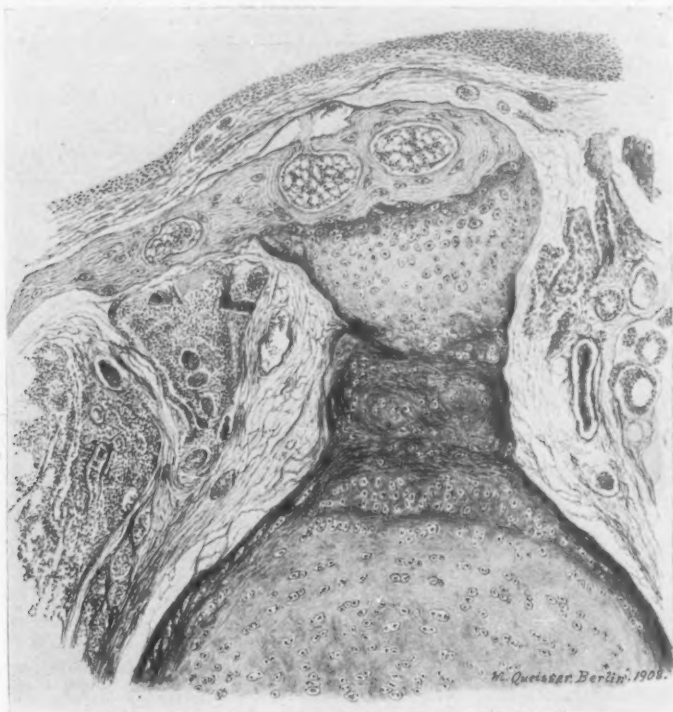
MICROSCOPIC DESCRIPTION. (OF FIRST CASE ONLY).

Even with fairly low magnification, the stained sections offer an unusual and striking picture. New-formed bone is distributed through the submucosa and confined pretty well to it. The bone structure is lamellar, and in some places the lamellae surround typical Haversian canals; the larger plates, with enclosed loose connective tissue and blood-vessels, contain spaces with ordinary fat marrow.

The bone masses divide themselves into two groups, according to their relation to the ring cartilages. In the first group are those which are in close relation through an intervening column of cartilage or *ecchondrosis* (see figure). In the second group belong

those which are connected by finer or coarser strands of connective tissue with the normal perichondrium, or one of the annular ligaments.

The greater interest attaches to those parts where there is the more direct connection between a bone plate and a ring cartilage. (In many of the cases already reported no such relation was



Leltz. Oc. 2. Obj. 3.

Section of Trachea. Ring cartilage, with ecchondrosis surmounted by flat plate of bone.

found. Eppinger was the first to describe ossification of an actual ecchondrosis).

A glance at the accompanying figure will show at once what is meant.

From the upper part of the normal cartilage rises an ecchondrosis. This reaches upwards to the submucosal layer as a wide column. Here there is a transition from cartilage into bone with-

out a well-defined margin separating the tissues. The bone continues upwards to the sub-epithelial layer, and also spreads itself to right and left in a direction parallel to the epithelium.

Upon higher power we find that the matrix of the ring cartilage and that of the ecchondrosis are continuous with one another. At the periphery of the cartilage elsewhere the cells become flattened, but here we find no such change. The cells are large, numerous and grouped more or less regularly. Where, in the normal case, perichondrium should bound the matrix, here the ecchondrosis is crossed and recrossed by connective tissue fibers (cf. Ribbert). These fibers are directly continuous with the perichondrium; they separate to enclose small groups of cartilage cells. Similar fibers running transversely, or in whorls, are to be seen in the upper part of the ecchondrosis. They all stain deep red with van Gieson.

Other more delicate elastic fibers can be seen in the upper part of the ecchondrosis; these stain black with Weigert and are similar to those described by Moltrecht.

The cartilage cells lie encapsulated in the matrix. They are irregular in their grouping. Single capsules contain from one to six cells.

Towards its upper part the matrix condenses, and in the zone neighboring upon bone, it becomes finely granular. Its granules stain deeply with haematoxylin.

In this upper part the cartilage cells retain their staining properties, and lie singly or in pairs; here and there they appear larger, more vesicular and more numerous. There is no typical arrangement of the cells in columns, as in physiological enchondral ossification.

In intimate relation to this zone we find compact bone. The bone margin is wavy, and here and there sends out tiny processes, which reach into the granular area and embrace the cells in it.

A little beyond this margin and completely surrounded by bone, come numerous cells; some of them resemble closely, in nucleus and protoplasm, small cartilage cells. Even the spaces in which they lie are like those about cartilage cells, being fairly roomy, circular or oval, and communicating one with another. This last feature is rare, but none the less definite.

From this cartilage cell type, we can follow a gradual adaptation of form to the prickle-shaped bone corpuscle in its narrow cleft. The bone changes its appearance from a structureless mass to regular lamellae.

It is worth while to compare with this ossifying ecchondrosis a second and somewhat different part. Here we have to do with a modified matrix.

As we examine the ring cartilage from center out to periphery the matrix and cells undergo the usual changes. The staining properties of the ground substance alter markedly; with haematoxylin-eosin it stains a bluish red, and with haematoxylin-van Gieson a deep red. The cells become flattened and their spaces narrower; at the same time they arrange themselves in rows parallel to the fibers of the perichondrium.

This substance extends itself upwards, bounded on each side by connective tissue, continuous with the perichondrium and similar to it.

It contains a few elastic fibers.

Here and there the cells have not the flattened shape, but take on the form of fully-developed cartilage cells. They lie in pairs in wide spaces, or two adjacent in separate capsules.

Blood vessels are lacking, except near the perichondrium.

The tissue corresponds in fact very closely to that described by Borst (*loc. cit.*) as osteoid tissue, except for the almost entire absence of blood vessels.

As in the part already described, there is a granular zone which passes over into compact bone.

In neither of these two ecchondroses is there a preliminary rarefaction of the matrix, or invasion by blood vessels.

The processes, ordinarily at work in enchondral ossification, here play no part; that is to say, a vascularizing of the ground substance, and its replacement by bone. Here, on the contrary, the cartilage cells pass over into bone corpuscles and matrix changes to compact bone substance. Such metaplasia is recognized as sometimes occurring, by Koelliker,³⁰ Ebner³¹ and Kopsch.³²

The bone throughout, as already emphasized, shows true lamellar bone systems. In several places one can even see the physiological cross-rings of the lamellar system. Lining the medullary cavities of this bone formation, several cells of osteoplastic character in short rows can readily be distinguished.

Bordering upon several of the lamellar bone plates are smaller bone particles, which apparently are formed from the surrounding connective tissue. Others similarly situated and of similar origin are cartilage in character. These latter two conditions are best seen in specimens stained with van Gieson.

Finally, overlaying the lamellar bone, one can detect sometimes some *periosteal* bone formation. Here we see several large and irregular bone corpuscles in a small amount of homogenous-looking osteoid ground substance.

However, these last findings relative to the outstanding un-lamellated bone and cartilage play a very limited role in comparison with the predominating lamellar bone of cartilaginous origin.

Most of the reported cases have shown islands of bone and cartilage in the meshes of the submucosal connective tissue. Similar isolated platelets are to be seen here. Some are entirely cartilaginous, some partly cartilaginous and partly bony, and others again entirely bony.

In some of these so-called islands, by following them through serial sections, I have found a connection between them and larger plates. In fact, they are not isolated platelets, but simply processes of larger plates.

Other very irregular masses of cartilage lay in loose connective tissue in which were numerous blood vessels.

Osteoclasts are also present, giant cells lying in typical Howship's lacunae.

The blood vessels of the bone spaces communicate freely with those of the periosteum or connective tissue surrounding the bone.

EPITHELIUM AND MUCOUS GLANDS.

Owing to post-mortem changes, and also perhaps to prolonged washing during the decalcification, the epithelium is in most places poorly preserved. Its layers are poorly differentiated and there is active desquamation.

A few places, however, allow of fairly exact description. Cylindrical ciliated cells fail entirely; the epithelium has undergone complete metaplasia from a cylindrical to a stratified squamous form.

Where gland ducts open on the surface, their lining membrane is layers of either stratified epithelium or cubical epithelium.

The subepithelial elastic membrane is preserved well. It stains black with Weigert.

The submucosa is in great extent occupied by the new-formed bone, which may fill in nearly all the space between epithelium and normal perichondrium or cartilage. The thin connective tissue layer between bone and epithelium, and the tissues surrounding the

gland ducts contain dilated blood vessels. This congestion is only a part of the hyperaemia associated with the pneumonia and bronchitis.

The glandular layer shows a marked overgrowth of connective tissue, especially in the intercartilaginous spaces where the glands are normally most abundant. Bands of connective tissue course through it, connecting the periosteum or perichondrium of the abnormally developed bone or cartilage with the normal perichondrium and the annular ligaments.

The inter-glandular septa are thickened. The capillary vessels coursing in them show irregular constrictions and dilatations.

The secreting cells of the mucous glands and the inter-alveolar septa on the other hand show advanced degenerative changes. The nuclei of the former lie close to the supporting fibrillar lamina, their protoplasm is granular, and their margin ill-defined. Some alveoli show cystic dilatation; their lining cells are flattened, and their lumina filled with cellular debris. The inter-alveolar septa are atrophic, and in places have disappeared, thereby throwing adjacent alveoli into a single cavity.

In the tissue about the alveolar glands is an abundant round-celled infiltration. Amongst the leucocytes the fine meshwork of the connective tissue of the part can still be seen.

SUMMARY.

We have here to do with an abnormal formation of cartilage and bone in the mucous membrane of the trachea.

The condition seldom causes symptoms, and is as a rule a post-mortem finding.

In some of the cases where it has been observed clinically, there have been associated with it chronic inflammatory or atrophic changes of other parts of the respiratory mucous membrane.

The larynx and bronchi are less often the seat of the cartilage and bone formation than the trachea.

As a rule the process limits itself to the anterior and lateral parts of the trachea; but in a few cases the membranous portion also is involved (those reported by Wilks, R. Heymann and Birch-Hirschfeld).

The new growths are most often cartilaginous and bony. Cohen and O. Chiari reported only cartilage in their cases, and Dennig and H. Chiari only bone.

In at least three cases there were chronic inflammatory conditions present locally, which seemed to have some etiological bear-

ing; scleroma in those reported by O. Chiari and Ganghofner, and tuberculosis in that of Ziegler.

In the other cases, however, we do not find chronic inflammation present to explain the process.

It is manifest that some of the bone plates are ossifying or ossified ecchondroses. But the others lie quite free of the ring cartilages, e. g., these reported as occurring in the membranous portion.

All appear to owe their existence to an activity in cartilage production, such as normally belongs only to the perichondrium of the rings, but which here displays itself in neighboring tissues. Such a characteristic is readily explained if we regard the tissues as derived from embryonal perichondrium.

In short, the process represents a displacement of this embryonal tissue, and its later activity in its abnormal position. Therefore the detached new growths of cartilage can fairly be termed enchondromata.

Although it cannot be proved, it is probable that all were at first cartilaginous and later underwent more or less change into bone. From careful examination of my own sections, I am led to believe that this ossification is not the customary enchondral form, but a true metaplasia from cartilage into bone.

In this last respect I have taken the liberty of stating my own views, which are at variance with those of Dr. Pick. He compares the boundary line between cartilage and bone with that found between epiphysis and diaphysis in an elderly child, even though the order is here not perfectly physiological. On the ground of this resemblance, and of the pronounced cross rings of the lamellar bone systems, he considers that we have a true repetition of the findings in physiological enchondral ossification, although we may be unable to follow all the steps of the enchondral ossification.

In conclusion I should like to express my thanks to Dr. Pick, the Prosector of the Pathological Laboratory at the Friedrichshain Hospital, for the opportunity of reporting this case, and for his direction and advice.

BIBLIOGRAPHY.

1. VON BRUNS: Zusammenstellung von Tumoren, in Heymann's Handbuch der Krankheiten des Halses und der Nase. Berlin, 1897.
2. MOLTRECHT: Fortschritte auf dem Gebiet der Röntgenstrahlen. Vol. VI, 1902-03, p. 169.
3. WILKS: Transaction of the Pathol. Soc. of London, Vol. VIII, 1857.
4. VIRCHOW: Die Krankhaften Geschwulste, Vol. I, 1863, p. 442.
5. STEUDENER: Virchow's Archiv. Vol. 42, 1868.

6. CHIARI, H.: *Wiener Mediz. Wochenschrift*, 1878. No. 34.
7. COHEN: *Diseases of the Throat and Nasal Passages*, 1879, p. 511.
8. EPPINGER: in Klebs Handbuch der Pathol. Anat. 1880.
9. GANGHOFNER: *Zeitsch. fuer Heilkunde*, 1880, p. 350.
10. CHIARI, O.: *Wiener Mediz. Jahrbuch*. 1882.- *Die Krankheiten des Kehlkopfes und der Luftröhre*, 1905, p. 380.
11. DENNIG: *Beiträge zur Pathol. Anat. und Physiol.* Vol. II, 1888, p. 103.
12. HEYMAN, R.: *Virchow's Arch.* Vol. CXVI, 1889.
13. HAMMER: *Zeitsch. fuer Heilkunde.* Vol. X, 1890.
14. MISCHAKOFF: *Inaug.-Dissert.* Zurich, 1894. Über Knochenbildung in der Trachealschleimhaut des Menschen.
15. VON SCHRÖTTER, L.: *Die Krankheiten der Luftrohre*, 1896, p. 42.
16. BIRSCH-HIRSCHFELD: Article on "Osteom" in Eulenberg's *Real-Encyclopaedie*. 1898.
17. VON RECKLINGHAUSEN: *Centralbl. fuer allgem. Pathol. und Pathol. Anat.* Vol. IX, 1898. p. 849.
18. VON SCHRÖTTER, H.: *Wiener klin. Wochenschr.* 1899, p. 414. *Klinik der Bronchoskopie*, 1906, p. 411.
19. LAW: *Brit. Med. Journ.* 1902. Part II, p. 571. Same case reported by Von Eicken.
20. SCHMIDT, MORITZ: *Die Krankheiten der oberen Luftwege*, 1903, p. 661.
21. MANN: *Muench. mediz. Wochenschr.*, 1907. No. 23.
22. HEUTER: *Berichte der biol. Abtheil. des ärtz. Vereins Hamburg.* 1899. (Quoted by Moltrecht).
23. RODE: *Deut. mediz. Wochenschr.*, 1902. No. 2.
24. ZIEGLER: *Lehrbuch der allgem. Pathol. und der Pathol. Anat.* 1905-06.
25. VON EICKEN: *Arch fuer Laryngol. und Rhin.*, Vol. XV, 1904. p. 406 (annek.)
26. DEMME: *Allgem. Wuerzb. Mediz. Zeitung*, 1861. (Quoted by Such-)
27. RIBBERT: Über die Entstehung der Geschwulste. in *Deut. Mediz. Wochenschr.* 1895. Also *Lehrbuch der Pathol. Anat.* 1901.
28. BORST: *Die Lehre von den Geschwulsten.* 1902.
29. SUCHANNEK: Art. on Pathol. of respir. organs in Lubarsch and Ostertag's. *Ergeb. der allgem. Pathol. und Pathol. Anat.* 1. 3.
30. KÖLLIKER: *Handbuch der Gewebelehre des Menschen.* 1899. Vol I, p. 130.
31. EBNER: *Kölliker's Handbuch*, 1902. Edit. Vol. III.
32. KOPFSCH: *Rauber's Lehrbuch der Anat.* Vol. II, 1906.

THE NOSE AND NASOPHARYNX IN INFANTS AND YOUNG CHILDREN.*

BY J. M. INGERSOLL, M. D., CLEVELAND.

The shape and the relative size of the nose and the naso-pharynx change very much between the time of their development in the embryo and their permanent form later in life. The changes which take place in these structures in infants and young children have a decided influence upon the pathological conditions which may develop in the nose and nasopharynx and make any kind of obstruction in these regions a much more serious matter in young children than in adults.

The Development of the Nose and Nasopharynx.

The nose is primarily a special sense organ. In man, however, its respiratory function has become even more important than the olfactory function. The evolution of the organ of smell may be epitomized in the statement that the olfactory epithelium is a patch of infolded ectoderm with highly specialized cells which are brought into relation with the central nervous system by means of the outgrowth from the latter, of the olfactory lobe.

Early in intra-uterine life the olfactory plates appear just above the oral fossa and owing to the rapid outgrowth of the surrounding tissue these plates become relatively depressed and form the nasal pits (about the twenty-eighth day). The nasal pits are separated from each other by a broad mass of tissue, called the naso-frontal process, which thickens along its lateral margins and forms the globular processes (Fig. 1). At the same time the lateral nasal processes bud out from the nasofrontal process, above the nasal pits and growing downward form the external boundaries of the pits. Inferiorly the pits are directly continuous with the oral fossa.

About the end of the sixth week the nasofrontal process is joined on each side by the united maxillary and the lateral nasal processes and the nasal pits are thus shut off from the oral fossa. The orifices of the nasal pits form the anterior nares and the pits have become short canals opening through their deep orifices, the posterior nares, into the primitive mouth cavity behind the maxillary processes.

*Read before the American Laryngological Society, Boston, Mass., June 1, 1903.

The nasal fossae are widely separated by the broad nasofrontal process but during later development this process narrows down to form the septum and is gradually elevated above the surface of the face. As the nasofrontal process grows narrower, the globular processes are brought nearer together and fusing in the median line, form the premaxillae and the middle third of the upper lip. Dr. H. P. Mosher has shown that the irregular development of the premaxillae is one of the important factors in causing deviations of the nasal septum. The palatal shelves grow toward the median

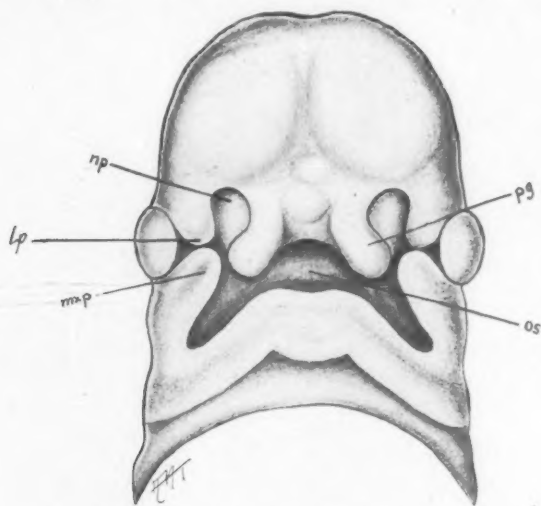


Fig. 1. Face of embryo of 8 mm. (enlarged from His.); m. x. p., Maxillary process; n. p., nasal pit; o. s., oral fossa; p. g., processus globularis; l. p., lateral nasal process.

line and uniting with each other and with the nasofrontal process prolong the nasal fossae posteriorly so that at the end of the third month the posterior nares open into the nasopharynx instead of the mouth.

At least three and sometimes four or five folds of the ectodermic lining on the external lateral walls of the nasal fossae project horizontally inward and form the maxillary and ethmoidal turbinates. Each fold contains a fold of mesodermic tissue which develops into cartilage and later into bone.

The maxillary sinus is formed during the third month by an evagination on the lateral wall of each nasal fossa, between the

maxillary and ethmoidal turbinates. The ethmoidal, frontal and sphenoidal sinuses are formed later and the last two are not completed until after birth.

Very early in the development of the nose a small invagination appears on each side of the median wall of the nasal pits. During the fourth month, this becomes a small pouch in the septum ending blindly posteriorly. This is the rudiment of Jacobson's organ which in macrosmatic animals is much more highly developed, communicates with the mouth and contains olfactory cells, connected with the olfactory lobes of the brain. In the lower animals its function

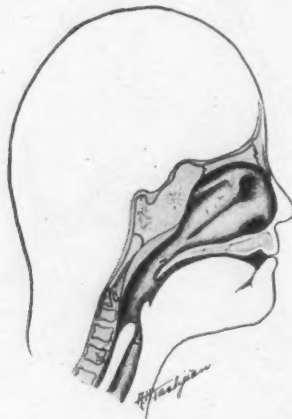


Fig. 2. Section showing the left nasal fossa, nasopharynx and pharynx of a foetus about the twelfth week. In this specimen there are only two ethmoidal turbinates—the agger nasi shows quite distinctly as a prolongation forward of the ethmoidal turbinate.

probably consists in bringing the food in the mouth under direct control of the olfactory nerve.

Foetus, about the twelfth week, Figure 2. The length of the nasal fossa in a foetus three months old is about 1.4 cm., its height about 0.7 cm. The length of the nasopharynx is about 1.3 cm. and its width between the Eustachian openings, is about 0.5 cm. The floor of the nose is quite straight and slopes downward slightly. The maxillary turbinate shows distinctly as a shelf-like process and touches the nasal floor lightly. The ethmoidal turbinates are well developed and are situated relatively more posteriorly in the nasal fossae so that their anterior ends are about over the

middle of the maxillary turbinates and their position thus corresponds more closely to the position of these structures in some of the lower animals.

The choana is nearly round, its transverse diameter being slightly greater than the perpendicular. The nasopharynx extends down-

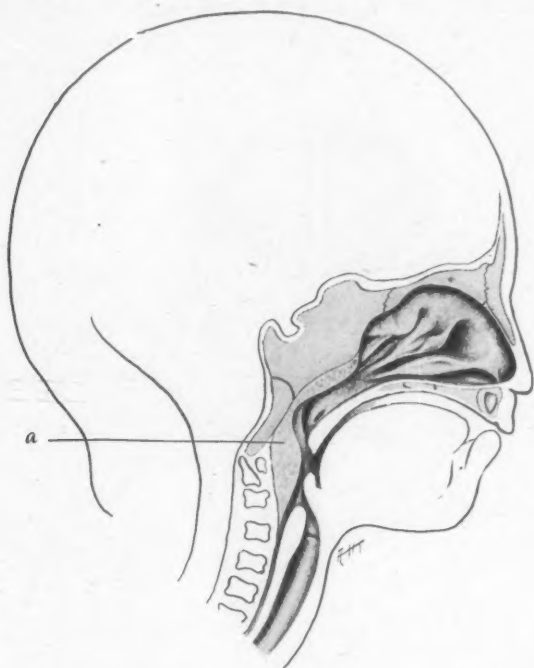


Fig. 2. Longitudinal section, showing the left nasal fossa, nasopharynx and larynx of a six-months old foetus; a—adenoid tissue. The maxillary turbinate is well developed; four ethmoidal turbinates can be seen; the nasopharynx contains quite a large mass of adenoid tissue; the inferior border of which extends down below the opening of the larynx.

ward and backward from the nose and is only very slightly curved. The opening of the Eustachian tube is elliptical and is nearly parallel with the floor of the nose. The larynx is relatively very high up being about opposite the second vertebra. The tongue is proportionately much thinner at its base than it is later. The width of each nasal fossa is relatively less than in the adult because the septum in the foetus is much thicker.

Foetus, sixth month, Figures 3 and 4. In a foetus of the sixth month the turbinates are all more prominent and the meati are well marked. The septum is proportionately somewhat thinner and the nasal fossae are consequently a little wider. The maxillary sinus shows distinctly as a narrow cavity, its lateral walls being almost in apposition. Very shallow depressions in the frontal, ethmoidal and sphenoidal bones suggest the beginning of the sinuses in these regions. The nasopharynx is somewhat more sharply curved than it is in a younger foetus. Hypertrophied adenoid tissue may be

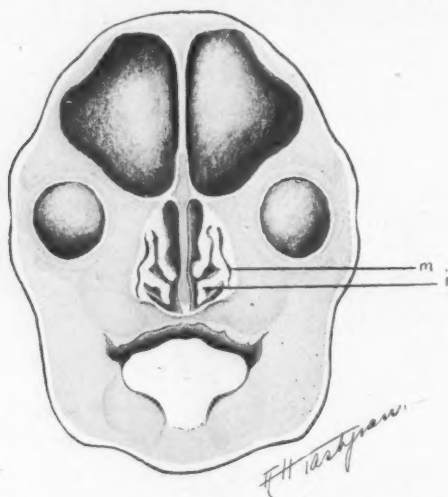


Fig. 4. Transverse section through the head of a foetus six months old, showing both nasal fossae; the maxillary sinuses can be seen as narrow cavities with their walls almost in apposition; m—maxillary sinus; i—inferior turbinate.

present and its relative position is much lower than it is in children and adults so that its inferior portion may extend below the opening of the larynx. The larynx remains relatively high about opposite the third vertebra.

Foetus, eighth month, Figure 5. In a foetus of the eighth month the length of each nasal fossa is about 3.0 cm.; the height about 1.4 cm.; the width about 0.5 cm. The length of the nasopharynx is about 2.4 cm. and its width between the Eustachian openings 1.3 cm.

The turbinates and the meati are sharply defined. The floor of the nose and the soft palate are flat and slope downward slightly.

The nasopharynx curves downward and backwards and its posterior wall presents a smooth, regular outline, if it is free from adenoid tissue. The larynx is about on a level with the upper border of the fourth vertebra.

Child, six months, Figures 6 and 7. In a child about six months old the length of each nasal fossa is about 4 cm., the height is about

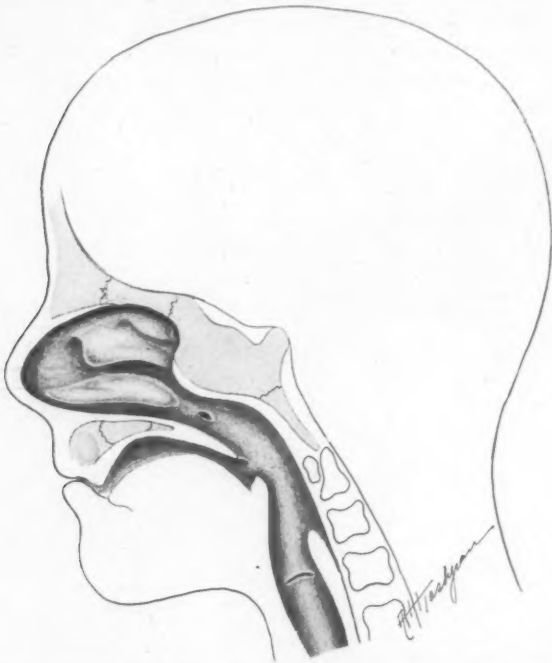


Fig. 5. Section showing the right nasal fossa and pharynx of a foetus about eight months old. In this specimen only two ethmoidal turbinates are present; the nasopharynx is free from adenoid tissue; the elliptical opening of the Eustachian tube is nearly parallel with the floor of the nose.

1.8 cm., and the width 0.7 cm. The width of the nasopharynx is about 1.6 cm. and its length 3 cm.

The general conformation and the relative position of the turbinates are nearly the same as in the adult. The palate is slightly curved. The long axis of the Eustachian opening is nearly parallel with the floor of the nose. The posterior boundary of the nasopharynx is sharply curved. The larynx is about on a level with the fourth vertebra.

If there is much hypertrophy of the adenoid tissue it may obstruct not only the posterior nares, but also the larynx, for the nasopharynx is relatively low and the larynx is relatively high.

Summary. During foetal life and early infancy the relative proportions of the length and the height of the nasal fossae remain about the same—that is, the length is about twice as great as the height. After the second year, the height increases more rapidly. On account of this increase in height of the fossae, the choanae,

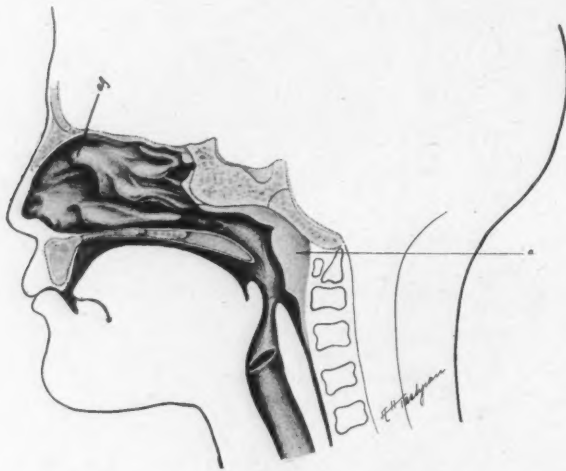


Fig. 6. Longitudinal section, showing the right nasal fossa, nasopharynx and larynx of a child about six months old. The outline of the maxillary turbinate is about the same as in an adult. Four ethmoidal turbinates can be seen. The agger nasi shows distinctly as a rounded process extending forward from the anterior part of the ethmoidal turbinate. A small diverticulum extending into the sphenoidal bone shows the beginning of the formation of the sphenoidal sinus. The long axis of the Eustachian tube is nearly parallel with the floor of the nose. The nasopharynx contains a rather large mass of adenoid tissue, which extends down below the opening of the larynx. The tongue is relatively thin posteriorly. The larynx is relatively high. A. g.—agger nasi; a—adenoid tissue.

which are nearly round in infants, become decidedly elliptical and the perpendicular diameter of each choana becomes about twice as great as the transverse diameter.

The width of each nasal fossa is relatively less in an infant than it is in an adult and hence any pathological lesion causing nasal obstruction in an infant is a more serious matter than it is in an adult. This is so not only on account of the relatively greater in-

terference with respiration, but also because the nasal obstruction causes decided interference with the taking of nourishment.

The septum is relatively much thicker in the embryo and young infant than it is later in life. The general form of the maxillary turbinate remains very nearly the same during its whole development. The ethmoidal turbinates show many variations. Two are always present; there may be three, four, or occasionally even five ridges which correspond with the much more complicated development of these structures in many of the lower animals. The fourth and fifth ethmoidal turbinates usually disappear in early infancy.

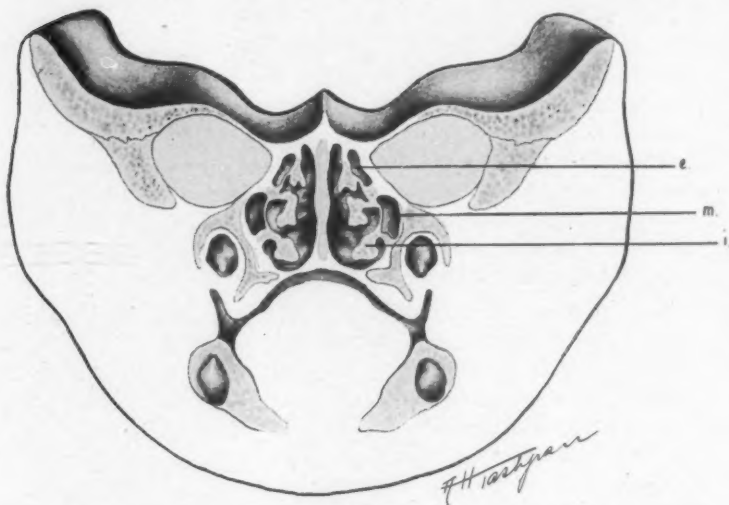


FIG. 7. Transverse section through the head of an infant six months old, showing both nasal fossae. The maxillary sinuses show as rather oval cavities. Two ethmoidal cells show distinctly. E—ethmoidal cell; m—maxillary sinus; i—inferior turbinate.

The third ethmoidal turbinate remains in about eighty per cent of cases.

The agger nasi is a slight elevation at the junction of the anterior end of the middle turbinate (first ethmoidal turbinate) with the nasal process of the superior maxillary bone and is the rudiment of the nasal turbinate of the lower animals.

The maxillary sinus appears about the middle of the third foetal month. The frontal sinus begins as a slight depression extending upward from the nasal fossa in the third foetal month. It is

however, so small that it can hardly be called a sinus until about the seventh year when the true sinus is formed by the separation of the two tables of the skull.

The ethmoidal cells appear first during early foetal life as small depressions which grow by the absorption of the bone. The sphenoidal sinus is primarily a constriction of the primitive nasal fossa and begins to form in the third foetal month. The space is so rudimentary that not until the seventh year has there been sufficient absorption of the cancellous bone to make the sinus apparent.

The organ of Jacobson develops at a very early period and after the fifth foetal month it usually begins to disappear.

The hard palate at birth is about on a level with the junction of the sphenoidal bone and the basilar portion of the occipital bone. At three years it is opposite the middle part of the basilar portion and at six years it is about the same as in the adult, opposite the anterior edge of the foramen magnum.

The soft palate at birth is nearly horizontal and about on a level with the atlas. The tongue is relatively thinner at its base in an infant than it is in an adult.

The nasopharynx at birth is a tube-like structure extending downward and backward. It is relatively long and shallow.

Hypertrophied adenoid tissue may be congenital. If it is present in an infant, it may obstruct the nasopharynx and also the larynx on account of the high position of the latter. The obstruction and irritation of the larynx in this way is probably one of the chief factors in the causation of croup and other lesions of the larynx in children with adenoids. It seems probable also that the relatively low position of the adenoid tissue might make deglutition more difficult. It may be seen in some cases by direct inspection through the mouth if the soft palate is elevated and drawn slightly forward. On account of its relatively low position, it may be easily felt in a careful examination with the finger. The advisability of its removal is self evident, regardless of the age of the child.

The openings of the Eustachian tubes are elliptical and the long axis at birth, is nearly horizontal. The Eustachian prominences are only slightly raised above the surrounding tissue and hence are less liable to be injured in operations in the nasopharynx in infants.

On account of the small oral cavity and the shape of the nasopharynx in infants a curette with a straight handle and its blade set at an angle of fifty-five degrees to the handle will follow the posterior wall of the nasopharynx better and remove the hypertrophied

adenoid tissue more completely than it will if the blade is more nearly perpendicular to the handle as it is in many curettes. The bayonet curette of Fein was devised to permit greater latitude in the movement of the curette and thus allow its blade to follow the conformation of the nasopharynx. The width of the curette blade should be determined, of course, by the width of the nasopharynx. A curette 1.3 cm. in width with a blade 1 cm. in width, is probably small enough for all infants.

The shape of the nasopharynx in infants makes it practically impossible to do a complete adenotomy with forceps.

BIBLIOGRAPHY.

1. J. F. McMURRICK: The Development of the Human Body.
2. J. C. HEISLER: Text Book of Embryology.
3. M. T. SUDLER: The Development of the Nose and the Pharynx and its Derivations in Man. *American Journal of Anatomy*, Vol. 1, p. 391.
4. H. P. MOSHER: The Premaxillary Wings and Deviations of the Septum. *THE LARYNGOSCOPE*, November, 1907.
5. HERMAN JARECKY: Adenoids in Infants. *New York Medical Journal*, Vol. 80 (1904), p. 309.
6. J. L. MORSE: Adenoids in Infancy. *Journal American Medical Association*, Nov. 9th, 1907, p. 1589.
7. PROF. E. J. MOURE: Adenoide Vegetationen. *Allgemeine Wiener Medizinische Zeitung*, Dec. 26th, 1905.
8. W. L. CARR: The Practice of Pediatrics. (1906).
9. GUSTAV KILLIAN: Zur Anatomie der Nase Menschlicher Embryonen. *Archives für Laryngologie und Rhinologie*, Band III., p. 16.
10. GEORGE A. PIERSON: Human Anatomy.
11. QUAIN: Elements of Anatomy.
12. W. F. CHAPPELL: Remarks on the Diagnosis of Adenoids in Infancy. *Transactions of the American Laryngological Association*, 1901, p. 39.
13. C. C. RICE: Post-Nasal Adenoids; How Shall the Diagnosis be Made in Young Children? *Transactions of the American Laryngological Association*, 1903, p. 168.
14. A. KOLLEKER: Neben das Jacobsonsche Organ des Menschen.
15. L. A. COFFIN: The Development of the Accessory Sinuses of the Nose. *American Journal of the Medical Sciences*, Feb., 1905.
16. WIEDERSHEIM AND PARKER: Comparative Anatomy of the Vertebrates.
17. R. WIEDERSHEIM: Structure of Man.
18. W. SPALTEHOLZ: Hand Atlas of Human Anatomy.
19. E. ZUCKERKANDL: Anatomie der Nasenhöhle.
20. H. W. LOEB: The Anatomy of the Middle Turbinate. *Journal American Medical Association*, June 1907.
21. EFFIE READ: A Contribution to the Knowledge of the Olfactory Apparatus in the Dog, Cat and Man. *American Journal of Anatomy*, May 1908.
22. LEON DIENLAFF: Morphology and Embryology of the Nasal Fossae of Vertebrates. *Annals of Otology, Rhinology and Laryngology*, March, June and September, 1906.
23. F. GRAF VON SFE: Skelettlehre, Kopf.
24. A. RAUBER: Lehrbuch der Anatomie des Menschen.
25. JOHANN FEIN: Die Abtragung der Rachenmandel mit dem Bajonettförmigen Adenotomie.

A MODIFIED MIKULICZ OPERATION: WHEREBY THE ENTIRE LOWER TURBINATE IS SAVED IN INTRA-NASAL OPERATIONS ON THE ANTRUM OF HIGHMORE; WITH PRESENTATION OF A PATIENT.*

BY GREENFIELD SLUDER, M. D., ST. LOUIS, MO.

The operation of opening into the Antrum of Highmore through the lower meatus of the nose was first described by Schaeffer¹ in 1885, next by Mikulicz² in 1886. It seems to be known usually by the name of the latter. Lack³ describes it as "Krause's Method."

Since then the route of the lower meatus has had many advocates, some of whom have varied the technique. Krause,⁴ 1897, modified the instruments, using a curved trocar with a strong handle and ball-tipped stylet. Grant,⁵ in 1898, first removed the anterior half of the lower turbinate, as a curative procedure in chronic empyema of the antrum. Pegler⁶ at the same time advocated the removal of the anterior portion of the lower turbinate, as facilitating the introduction of a tube by the patient and thus enabling him to wash out the cavity. Claude⁷ resects the turbinate, and opens the antrum with a trephine. Mouret⁸ urges conservative resection of the turbinate, with a view to minimizing the drying which follows extensive resection. Vail⁹ makes a window-like opening through the lower turbinate and the lateral wall of the nose by means of a saw bent on the flat. Ostrum¹⁰ devised a forward-cutting forceps for removing the lateral wall. Ballenger¹¹ first removes the lower turbinate by means of his swivel knife, and then the lateral wall by means of his antrum swivel knife or right-angled knife. Corwin¹² devised chisels for the same purpose. Wells constructed a canula-rasp for this purpose. Myles¹³ devised a barbed canula or reverse chisel for the same purpose. Lack¹⁴ punctures the antrum as in the Krause method; but inserts a canula with the outer end just within the anterior nares, through which the patient may irrigate the cavity.

Thus far the descriptions have been of operations confined to the lower meatus.

Rethi¹⁵ enlarges the opening upwards, to include a part of the middle meatus. Freer,¹⁶ too, has advocated a large comprehensive opening.

*Read before the St. Louis Medical Society—Laryngological Section—September 19, 1909.

Rhinologists now seem agreed that the Mikulicz or a modified Mikulicz operation is the choice of the conservative methods, both as affording permanent drainage and doing away with the necessity of habitually wearing a plug. Should these conservative means prove insufficient, and a radical operation be required later, the opening into the lower meatus will not have been in vain. Its great drawback is the removal of a considerable portion of the lower turbinate,

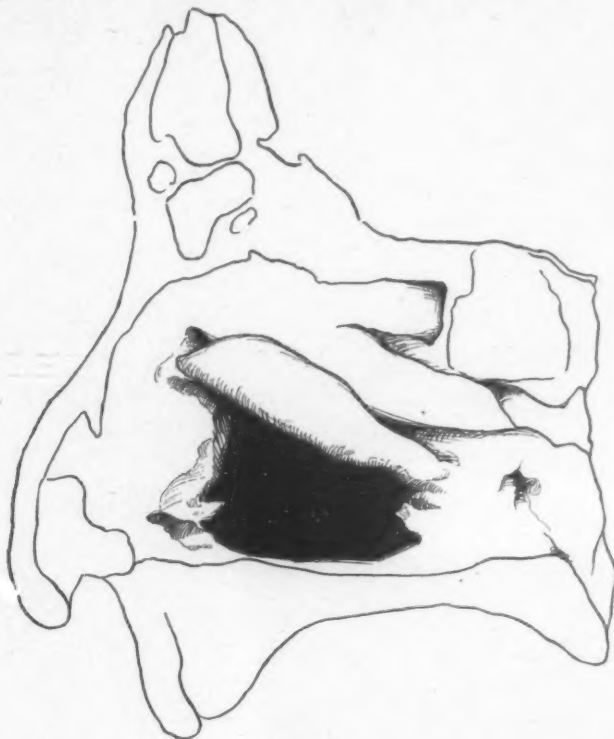


FIG. 1.

which is followed by some drying of the corresponding nostril. Furthermore, the stump is very apt to become hypertrophied, in which case it may have to be removed later with the disadvantage of causing increased dryness of the nostril. Hajek¹⁷ emphasizes this tendency to hypertrophy, and offers the explanation, that it is probably a result of congestion following lesion of the blood-vessels incidental to the resection.

At the meeting of the American Medical Association—Section of Laryngology—held in Chicago, June 1, 1908, while discussing Canfield's Submucous Resection of the Lateral Wall of the Nose, I described my own modification of the Mikulicz Operation.¹⁸ The operation, as I then described it, and as I have performed it for the past four years, is exceedingly simple in execution; it in no wise interferes with making a large opening into the antrum; and, when

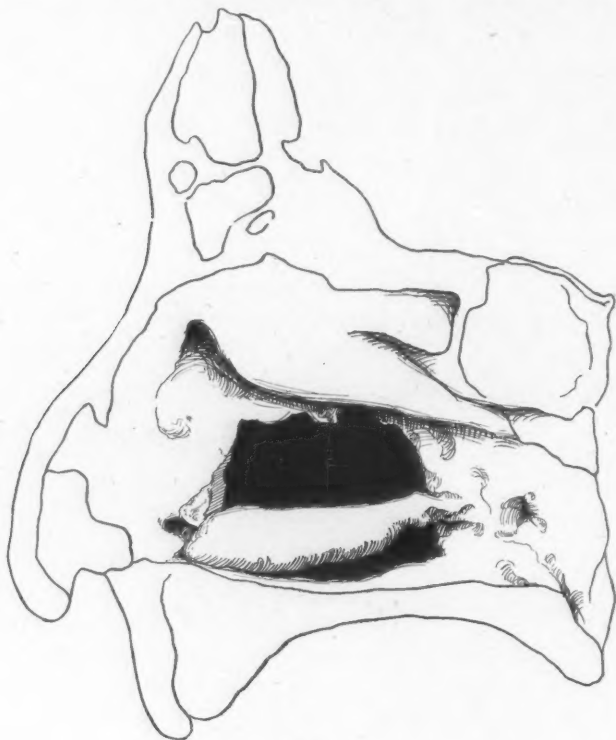


Fig. 2.

properly done, assures a permanent, free opening for drainage. It avoids, moreover, the subsequent drying, which is the only drawback (Hajek *loc. cit.*) to this otherwise perfect operation. It involves only an insignificant lengthening of the time required in operating.

The procedure consists (1) in cutting the lower turbinate from the lateral wall, as far back as its posterior fourth or fifth, by means of scissors. The detached part is then pushed well upwards,

while the operator removes the lateral wall of the lower meatus (Fig. 1.) The detached part of the lower turbinate is next pushed down into the lower meatus, while he removes as much of the lateral wall of the middle meatus as he wishes (Fig. 2.) In this manner it is possible to remove the entire inner wall of the antrum as far forward as the nasal process of the maxilla. There will still re-



Fig. 3.

main the ridge on the nasal process, for the reattachment of the lower turbinate, which is now replaced in its original position, carefully apposing the cut surfaces at the anterior end (Fig. 3.). Often the parts may be held in position by means of a little cotton or gauze. If this is found to be insufficient, one or two stitches suffice to hold everything perfectly in place. In fifty-three cases, I have never seen the bone fail to unite, or undergo degeneration. No subsequent hypertrophy has been observed. Some of my cases

are of four years' standing. The replaced turbinate in no wise interferes with the drainage, or with the final good result. It does away absolutely with any subsequent drying. This is an especial advantage in cases both of medium and wide nostrils, where some drying is sure to follow any removal of the turbinate. It is especially advantageous also in cases in which the middle turbinate must be or has been removed to drain a frontal or ethmoidal empyema. In these cases it conserves the heat and moisture functions of the nose, which would be lost were both turbinates removed. In atrophic rhinitis it is especially indicated.

In noses whose calibre is a little too wide or a little too narrow the angle of inclination of the turbinate may be altered in reattaching it, making it less acute for the former and more acute for the latter. This is readily done by tilting the bone upwards by a pack of gauze or cotton put underneath its body after it has been sewed in place, or by pressing the body slightly outwards by a pack between it and the septum. These packs must be continued throughout the healing, the bone afterwards remaining in its new position.

Curtis,¹⁹ in 1905, discussing the Mikulicz operation, makes a passing mention of a case in which the turbinate was small and permitted "turning it up by an Adams forceps into the fossa, and afterwards replacing the bone which was not large enough to interfere with syringing, but obscured the field of vision." This is the only mention I have been able to find in the literature of a case in which the turbinate was not resected. He was evidently not pleased with this method, for in two subsequent articles²⁰ on this subject he not only omits all mention of an effort to save the turbinate, but speaks very clearly of resecting it.

The plan of detaching the turbinate as far back as its posterior fourth or fifth seems to me much better than trying to turn it up, for the reason that the detached turbinate is readily pushed out of the way, affording free access to the entire inner wall of the antrum. The turning up of the turbinate can be a help in only the lower meatus operation.

It is my habit to remove the entire inner wall of the antrum—opening it into the middle as well as the lower meatus—replacing the lower turbinate as above described.

I believe that it is best to remove the wall of the middle as well as of the lower meatus, for the reason that an opening limited to the lower meatus will often close up, which, in my experience, is not the case with the larger opening made as I have described it.

The patient whom I present for your examination was operated upon in the above described manner in July, 1906. The result, which is a typical one, is all that can be desired.

[Discussion—Dr. Goldstein said that he was familiar with the idea and with a method of saving the lower turbinate in the Mikulicz operation—that such an operation had been described by Dr. Oskar Hirsch of Vienna, in the *Wiener Medizinische Wochenschrift*. Dr. Scholz remarked that he was personally acquainted with the work of Dr. Hirsch, and that Dr. Hirsch was indebted for the idea to a Russian author, whose name he (Scholz) could not remember.]

During the preparation of this paper a most diligent effort was made to omit the work of no one who had in any way contributed to the perfecting of this operation. The work of Dr. Hirsch, which had not then been found, appeared in the proceedings of the Wiener Laryngologische Gesellschaft for April 1, 1908, as published in the *Wiener Medizinische Wochenschrift*, No. 27, (July 4, 1908). At that meeting Dr. Hirsch presented two patients, the one operated upon February 26, 1907, the other February 18, 1908.

Herewith is a translation of his description:

"After anesthetizing the lower turbinate and the lower meatus with twenty per cent cocaine and Schleich's Solution, a long silk suture is put through the turbinate about one-half cm. back of its attachment and brought out of the nose. For this I use Killian's needle. The suture serves as a bridle to pull the detached turbinate from the lateral wall. Also it is easier to put it through the turbinate attached, than through the easily movable detached turbinate. The ends are tied to a piece of gauze and held up out of the way by an assistant.

"I next make a vertical scissors cut through the turbinate in front of the suture, connecting thereto a horizontal cut through its body so that more than half of the turbinate is loosened, to be drawn from the lateral wall by means of the silk suture. I then make an opening from the lower meatus with a trocar, and enlarge it by means of a double curette especially designed for such purposes. Then I sew the turbinate back in its original position by means of the suture previously passed through the turbinate, using the Killian needle again for this."

In closing his presentation Dr. Hirsch mentioned that he was familiar with the literature which told of efforts to save the lower turbinate, mentioning Halle, Lange, Wagener and Heerman.

The idea of saving the turbinate is common to the work of Dr. Hirsch and myself. He confines his field of operation to the lower

meatus. My procedure differs from this in the important respect that I include as much of the middle meatus as possible in the resection. In executing my operation the "bridle" used by Dr. Hirsch is unnecessary, and it would be in my way.

The first patient presented by Dr. Hirsch to the Vienna Laryngological Society, April 1, 1908, was operated upon February 28, 1907.

The patient presented to the St. Louis Medical Society, Laryngological Section, September 29, 1909, was operated upon July 17, 1906.

NOTES.

1. Clin. Erf. in der Rhinologie und Laryngologie, from Heyman's Handbuch d. R. u. L. 1900, Bd. III, S. 1091. K. der Kiefer h. R. 402 Killian.
2. MIKULICZ: Langenbeck's Arch., Bd. XXXIV, from Heyman's Handbuch, 1900, S. 1091. Ref. 418 KILLIAN, "Krankh. der Kieferhoele."
3. LACK: The Diseases of the Nose and its Accessory Sinuses, 1906. Longmans, Green and Co., London.
4. KRAUSE: *Berliner Klinische Wochenschrift*, 1907.
5. GRANT: London Laryngological Society, Meeting December 2, 1898. SEMONS, *Centralblatt*, 1899.
6. PEGLER: Meeting London Laryngological Society, December 2, 1898. Discussion.
7. CLAUDE: Traitement des Suppurations Chroniques, etc. Sem. Med. du 15 Octobre, 1902.
8. MOURET: De la resection du cornet inferieur, etc. Société Française de laringol. et otol., 1907, 13-16.
9. BALLENGER: Diseases of the Nose, Throat and Ear, Lee and Febinger, Philadelphia, U. S. A., 1908.
10. BALLENGER: loc. cit.
11. BALLENGER: loc. cit.
12. BALLENGER: loc. cit.
13. BALLENGER: loc. cit.
14. LACK: loc. cit.
15. RETHI: *Wiener Med. Wochenschrift*, 1901, and *Wiener Klinische Wochenschrift*, 1908.
16. FREER: LARYNGOSCOPE, May, 1905, St. Louis, Mo.
17. HAJEK: Pathologie und Therapie d. entzuendlichen Erkrankungen d. Nebenhohlen d. Nase, 3 Auflage. Verlag, Franz Deuticke, Wien, 1909.
18. CANFIELD: Sub-Mucous Resection of the Lateral Wall of the Nose, Discussion, *Journal A. M. A.*, October 3, 1908.
19. CURTIS: "Modern Methods of Accessory Sinus Treatment," LARYNGOSCOPE, May, 1905, St. Louis, Mo.
20. CURTIS: LARYNGOSCOPE, July, 1906, St. Louis, Mo.
21. CURTIS: LARYNGOSCOPE, May, 1907, St. Louis, Mo.

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LUPUS OF THE NOSE.

BY DON A. VANDERHOOF, M. D., ROCKFORD, ILL.

The reason I consider this case worth reporting is that for many months it has been under the care of good physicians, with no favorable results. Dr. C., who referred the case to me, had treated it very diligently indeed. Iodine had been applied for many months, and at one time it seemed as if an upper-hand of the disease had been obtained, but before it was entirely healed it began to grow worse again, and in a short time was as bad as ever. The patient, a female, age 25 years, came to the office on April 27th, 1909.

Previous history was as follows: About five years ago she had severe pain in left arm and shoulder, which continued intermittently for about nine months. She now noticed for the first time two red lumps about the size of a dime, which were situated just below the shoulder. A physician was seen and a slight operation performed, which did not relieve conditions. The pain remained very severe, and she was again operated on, and a considerable amount of tissue removed. This entirely relieved the trouble. About a year ago she noticed a few pimples on the right side of her nose. This condition slowly spread to both sides of the nose and, in a short time, a thin watery secretion was noticed to be oozing from them, small ulcers soon appeared and as the ulcerative condition became more extensive, the secretion became more thick and fetid; this was especially noticeable when the crusts became loosened.

The day she came to the office her nose was enormously swollen and covered almost entirely with thick crusts. These crusts also extended up into both sides of the nose, almost entirely filling the entrance into the nares. From both the nares a thick, yellowish pus was continuously discharging.

She had been having a considerable amount of pain in the nose for some time past, especially nights. I attempted to remove a few crusts, but they were so firmly attached to the underlying surface that the attempt to remove them not only caused a considerable amount of pain, but also some bleeding.

As she had been under very careful and thorough treatment with negative results, I decided at once to try the leukodescent light before doing any radical operative work upon the nose. The treatment consisted in concentrating the rays of light upon the diseased area for a length of time varying from five to ten minutes. The light

itself being kept at a distance varying from three to ten inches from the nose. Of course, when it is kept as close as three inches from the face it will be necessary to simply pass it over, the rays only resting for a second or so upon the diseased area. After the first few treatments it became noticeable that the patient could stand a great deal more heat than she could at first.

The first treatment, on April 27th, relieved the pain and feeling of pressure. The treatments were given daily for several days. After the third treatment a rapid diminution in the size of the nose was noticeable, and at this time also the crusts began to loosen up and drop off. No crusts whatever were removed by force. A few of the ulcers were so deep that crusts formed two or three times before they came off, leaving a dry surface.

After seven days, treatments were given every other day for five days. The end of the nose on the right side had been all necrosed away, so that there was a fairly large opening up into the nasal cavity, but the left side was considerably smaller than normal, and through this small opening came forth considerable pus. The right side responded nicely to the treatment, as the rays of the light could penetrate to all of the diseased parts, and so in a few weeks the larger irregular opening had contracted down to almost normal size. But the left side was destined to give considerable more trouble, and so prolong the treatment. This part appeared to be all undermined, and about the center of the nose on this side were three tiny openings, which were connected with this large undermining chamber underneath. From these openings during the day would ooze forth a few drops of a light colored discharge, and as it was very difficult here to get any light on the diseased parts, it was, under these circumstances, very hard to get the good results that one would desire.

It was now impossible to continue the treatments as often as we had done at first, she having to come some distance on the cars and could not afford to make such frequent trips. So, after this, treatments were given at very irregular intervals. On June 12th she came in for a treatment, this being the first one for quite a while.

The exterior of the nose was entirely healed, and she said it had shown no recurrence of the old trouble. The left side still discharged a little, indicating that the diseased condition had not entirely disappeared.

About a week later she came in, saying that the whole inside of her nose had come out. It appears that the day previous there had

been quite a discharge from the left side of her nose, at which time she had blown her nose very vigorously, and a considerable amount of pus and flesh came away. There was immediate relief, and she at once had plenty of breathing space.

Upon examination I found the septum had entirely disappeared, and by using the nasal speculum the leukodescent rays could be directed upon the diseased surface. Six more treatments in all were given, after which time the inner as well as the external surface of the nose appeared to be healed. She was to report at once if she thought there was any recurrence of the trouble, but nothing has been heard from her up to the present time.

I should have mentioned earlier in the article that during the time she was treated with the leukodescent light she was also receiving constitutional treatment. Fowler's solution of arsenic and the iodide of iron were used internally, while hygienic living was also advised and carried out in the best way possible.

500 William Brown Building.

THE TONSIL AND THE STYLOID PROCESS.

EDITOR THE LARYNGOSCOPE:

In the October issue of THE LARYNGOSCOPE, Dr. C. W. Richardson contributes a paper upon the prolongation of the styloid process into the tonsil, and quotes cases reported by Dr. Richards, Newcomb, and Glazebrook.

This is a subject to which apparently too little attention is still paid, because the presence in the tonsil of a styloid process would seriously complicate any operation upon the tonsil. I believe I was the first to draw the attention of the profession to this condition, when in 1896 I read a paper before the American Medical Association upon three cases which I had observed, exhibiting two of them to a number of the members of the Laryngological Section. This paper was printed, I think, in the *Journ. A. M. A.*, the same year; and in it I advised the digital examination of all tonsils before operating upon them.

Yours sincerely,

A. W. STIRLING, M. D.,

Atlanta, Ga.

SEPTICEMIA FOLLOWING SUBMUCOUS RESECTION OF THE NASAL SEPTUM; ONE DEATH; ONE RECOVERY.

BY HAROLD HAYS, M. D., NEW YORK CITY.

I wish to report the two following cases, because I believe they present unusual complications.

The submucous resection as performed universally nowadays throughout the United States, is considered more or less of a harmless procedure. If any complications have occurred they have not been reported in the literature. Besides looking up references, I have also made personal inquiries of men here in the city, and each one has claimed that he has never had such a serious complication as sepsis following a submucous resection.

I find some fifteen references in the literature to abscess of the nasal septum, which is supposed to be a rather rare condition. Most of these cases followed traumatism. Wm. L. Culbert, in the Transactions of the Laryngological, Rhinological and Otological Society, Vol. 9, reports a case of abscess of the septum with symptoms of septacemia. In the discussion of this case, George L. Richards cites the case of a physician who had an abscess of the septum followed by sepsis. Both cases recovered after incision into the abscess cavity. L. C. Cline, in Vol. 3 of the Transaction of this same society, reports the case of a young girl who was treated for typhoid fever for weeks. Subsequently it was determined that she had had some injury to the nose. An abscess of the septum had developed, which finally broke down, with subsequent recovery.

The two cases here reported occurred within a period of a few weeks in an experience of some hundreds of cases, either operated upon by myself, or by those with whom I am associated.

Case I.—Margaret M., eighteen years of age, stenographer, single. For the past two years she has been in such poor health that she has been unable to work. Has had no cough; appetite fair; feels general lassitude. Has had some obstruction to nasal respiration. She was told she had adenoids and came to the Clinic for adenoidectomy.

The girl was anemic, but seemed to be in fairly good physical condition. Examination of the nose showed a deviation of the septum to the right anteriorly, to the left posteriorly. Both middle tur-

binates were hypertrophied. Examination with the pharyngoscope showed that no adenoids were present. Examination of the throat and larynx negative. Transillumination negative.

She was told that an operation on her nose was necessary, and she therefore returned to the Clinic two days later (May 24th).

The septum was anesthetized with pledgets of cotton saturated with cocaine (4 per cent) and adrenalin (1:2000). More thorough anesthetization was accomplished some twenty minutes later with cocaine crystals. As the patient seemed to be in such a nervous condition, having intermittent jerky movements, particularly of the right side of the body, I decided to perform the operation in the recumbent position.

The operation itself was practically easy. There was no traumatism, so far as I could ascertain, other than the incision in the anterior part of the mucosa. The nares were packed lightly with gauze impregnated with bismuth subnitrate powder. The entire operation consumed less than one-half hour.

The patient returned to the Clinic two days later to have the packings removed. She complained of frontal headache, a symptom so often complained of when packings have been in the nose for any length of time. There was only moderate bleeding after the packings were removed. There was considerable edema of the musoperichondrial flaps and a frothy blood-tinged serous discharge. I told the patient to keep the nose clean with peroxid of hydrogen and to return in two days.

The day she was to return to the Clinic, I was informed that for the past forty-eight hours the headache had increased considerably, that her fever had reached 104 degrees F., she had had a chill lasting a half hour, and that she was so ill it was impossible for her to leave her bed. I went over to see her immediately. The girl was rolling around the bed in agony, suffering tortures from a terrific headache. Her face was drawn with suffering, but at that time there were no external indications of pus infection. The nares seemed to be perfectly clear. Temperature was 104.2 degrees, pulse 120, respiration 20. An ice bag was applied to the head, the nares were irrigated with an alkaline solution from a fountain syringe, the return fluid containing only a small amount of mucous. A large dose of morphine was given, which gave temporary relief.

I was again sent for the following evening. A decided change for the worse had taken place. The temperature had been remittent and another chill had occurred. There was a slight edema of

the eyelids on the right side, a slight exophthalmos, and some swelling of the right side of the face. There was tenderness over both frontal sinuses.

I determined to make an immediate exploration of the nasal cavities. Unfortunately the dry cells for my head lamp didn't give very good illumination. It was impossible to see beyond the swollen and edematous mucous membrane of the septum on either side. I opened up the incision in the septum on the right side. The edges of the wound looked unhealthy and boggy. A thorough exploration was made between the two septal membranes with a Freer periosteal elevator and cotton applicators. I was able to pass the instruments well up toward the cribriform plate. Not a drop of pus was found. I then explored the regions of the middle turbinates with probes and applicators. Only thick tenacious mucous adhered to the applicators.

I naturally suspected a septal abscess, which had finally extended to the cavernous sinus. At that time there were symptoms of beginning cavernous sinus thrombosis. I advised the removal of the patient to a hospital immediately. That night she was taken to New York Hospital and placed on Dr. Hartley's service.

The following notes were kindly made for me by Dr. Munroe of the Hospital Staff.

The ambulance surgeon found the patient's temperature 104 degrees, respiration rapid, right eye more prominent than the left, e. a., exophthalmos. There is also a swelling in the region of the right parotid gland. She complains of terrific headache. The neck is somewhat stiff and cannot be completely flexed. Kernig sign also slightly positive. No Oppenheim or Babinski. Pupillary reflexes equal. Chief complaints, headache, fever, exophthalmos. Blood count—W. B. C. 15000. Polynuclears, 90 per cent. Lumbar Puncture, about three drachms of slightly turbid fluid removed under some pressure. A smear showed numerous pus cells in large clumps. No organisms. A culture of the fluid was sterile in forty-eight hours. Temperature the following day was 106.2 degrees, pulse 120, respiration 24.

The parents, realizing that the patient was dying, took her home. From what I learned from the family physician, the symptoms increased in severity. The exophthalmos and swelling of the right side of the face became greater and he thought that an abscess was present. The patient died eight days after operation, never having lost consciousness until the very end. No autopsy was allowed.

I have no doubt that this was a case of septacemia (probably streptococemia), associated with a cavernous sinus thrombosis, and possibly meningitis. No petechiae were present on the skin. No blood culture was taken. However, the symptoms were so indicative of a general infection that no one who saw the case had any doubt that there were signs of sepsis.

Case II.—Elizabeth C., twenty years of age, came to the clinic about two weeks later with practically the same history. The history of this case was so like the other and the physical appearance of the girl was so similar that I was immediately struck by these facts.

The septum was deviated in its cartilaginous portion to the right. Both middle turbinates were hypertrophied. The nares were perfectly clean. The operation itself was a simple procedure, only the cartilaginous septum being removed. The procedure took a little longer than necessary, owing to the fact that I was demonstrating the operative technic to some post-graduate students. The patient, however, was not in the chair longer than a half hour. Keeping in mind the fact that too tight packing might cause trouble in such a case as this, only the smallest necessary amount was used.

Two days later the girl's mother returned to the clinic to tell me the patient was unable to leave her bed; that she had terrific headache and fever. I immediately went to see her, taking the necessary instruments and headlight along. Nothing could be seen except an edematous condition of the mucous membrane of the septum and an unhealthy appearance of the wound. I cleaned the nares as well as possible, prescribed adrenalin and Dobell's Solution and fairly large doses of morphine.

I need not detain you with a lengthy account of the next four days. The symptoms were practically the same as in Case I, except that there was no exophthalmos. I was in daily communication with the case and expected symptoms of cavernous sinus thrombosis to occur at any moment. I finally decided that nothing could help her unless I found the focus of infection; for I had no doubt an abscess was present somewhere in the nose. On the sixth day I had another physician, Dr. Heiman, give the patient chloroform anesthesia and carefully explored the nasal chambers. Adrenalin was first applied to the mucosa and then, after the engorgement had somewhat subsided I opened up the submucous incision. The space between the mucous flaps was dilated with a Killian Speculum. No pus was found. As I had about given up hopes of finding any-

thing, my elevator broke through into a pocket of pus well up above the middle turbinates. About one-half dram, I should judge, of thick ropy pus escaped. A counter-incision was made in the mucosa on the left side and two cotton drains inserted on the right side, one in the septal wound and one on the floor of the nose. These were removed in twelve hours and the nose irrigated with peroxide of hydrogen.

As soon as the patient awoke from the anesthesia, she felt better. The temperature fell to normal and remained normal. An immediate recovery took place. A week later, an examination in my office showed a healed wound in the septum and healthy condition of all the nasal mucous membranes.

I attribute the wonderfully quick recovery in this second case to a number of factors. First, the general treatment employed in cases of sepsis was employed here—supportive treatment. This consisted in giving the patient large quantities of water, food small in amount, at frequent intervals, mainly in the form of milk and buttermilk, and lastly, large doses of morphine and codein, as much as a half grain of the former twice a day and a grain of the latter every two to three hours. Alcohol sponges were used to reduce the temperature. The patient could not take whiskey, so that no other stimulants than those enumerated above were given.

There are many points of similarity in the two cases. Both were young girls of about the same age and the same build, both of Irish descent, both stenographers and both had felt too miserable to work for two years. Both were unusually bright and well educated. Both had a simple submucous resection performed. Both presented symptoms of septacemia. I have no doubt that the second case would have ended fatally if the pus focus had not been found. Moreover, I cannot help feeling that the first case might have recovered if a more thorough exploration under anesthesia had been made.

In reference to Case I, the question has come to my mind how an abscess occurring between the septal flaps could cause a cavernous sinus thrombosis. In studying the lymphatic and blood supply of the upper portion of the septum, I find that there are intercommunicating branches between the arteries and veins of the septum, and the arteries communicating with the cavernous sinus. The ophthalmic artery supplies the roof of the nose. Some of the veins accompany the ethmoidal arteries and terminate in the ophthalmic vein. A few veins communicate with the interior of the skull

through the cribriform plate of the ethmoid and the foramen cecum. The ophthalmic vein empties into the cavernous sinus through the sphenoidal fissure. Some of the lymphatics communicate with the subdural space. The venous return of the upper portion of the septum may be grouped into four sets: 1. An anterior set of veins which communicate with the anterior ethmoidal veins and a vein to the subdural space through the foramen cecum in the crista galli. 2. A middle set which communicate with the veins of the subdural space through the cribriform plate. 3. A posterior set which drains the postero-superior portion of the septum and communicate with the posterior ethmoidal veins. 4. An indefinite plexus of veins which communicate with the spheno-palatine veins and the veins lower down on the septum which empty into veins on the floor of the nose.

11 West Ninety-first street.

Preventable Deafness. W. SOHIER-BRYANT, M. D., *Jour. Amer. Med. Assn.*, July 10.

All deafness is preventable according to Dr. Bryant and its study involves consideration of all otology except that part dealing with equilibrium. The middle-ear changes causing deafness can be placed in two pathologic groups: 1. Ulcerative, necrotic, hypertrophic, adhesive and cicatricial processes. 2. Atrophic and sclerosing processes. The author's summary is given as follows: "Practically all deafness is due to the results of infection. Causes leading to infection are to be corrected, the soil is to be rendered non-retentive and the existing ear defects are to be treated at once. Avoidance of the infectious organisms, the maintenance of the nasopharynx in a healthy condition, the eradication of any existing infection, and the avoidance of impairment of the sympathetic nervous system through toxic action of fatigue or infection, will insure against deafness. To insure immunity from deafness, it is necessary for the individual to undergo a periodical oto-rhino-pharyngeal examination, perhaps once a year, so that any incipient middle-ear disturbance may be detected and corrected before the condition has become established."

STAPHYLOCOCCUS RHINITIS AS A CAUSE OF FOLLICULITIS EXULCERANS SERPIGINOSA NASI.

BY TIMOTHY J. REARDON, M. D., BOSTON.

This disease was first described by Kaposi, also well outlined in an article by Finger. There has been much discussion as to what group of skin diseases this malady belongs.

It is certainly very rare, since in fourteen years of hospital practice I have known but three cases, and these within the past year. Rhinological literature offers no reference, although four articles may be found elsewhere.

Case 1. Woman, aged forty-two years, married; has had trouble with nose the past two years. Began with frequent epistaxis, accompanied by considerable mucous discharge from both nostrils. About one year ago (November, 1907.) she noticed about the edge of the alae a papular eruption which shortly became pustulous, breaking down into an ulceration indisposed to heal, and causing an increase of muco-purulent crusts from her nose.

Ulcerations, varying in size and shape from a rice grain to a ten-cent piece, were covered with brownish-yellow adherent crusts, which on removal left shallow granulations with slightly reddened border. Location was wholly below the bony arch of the nasal vestibule, largest ulcerations appearing on right side at first and smaller ones on left, some also extending around edge of alae onto inner surface of same. Two ulcerations were likewise presented on upper lip; one, long and narrow, extending from septum through left nostril along ridge of lip; the other, heart-shaped, involving both skin and mucosa of the left side of upper lip. Practically no induration developed about borders of ulcer, though lip was markedly swollen and reddened.

She had been treated with the X-ray for five months without result. She had applied various ointments to the ulcerations, only two of them healing. She was given K. I. for one year with no effect, as soon as one healed another broke out. Ulcers showed a slight tendency to coalesce. Nasal skin was thickened and of a dull red color, extending to the bony arch and slightly onto cheeks, being marked about the labial ulcerations. When she first came under my care, three of these ulcerations, though covered with dark brown crusts, had healed, two on the right alae, and an elliptical one on the lip. Crusts were removed with green soap. Scars were slightly de-

pressed, white, of irregular outline, showing result of complete dermal destruction of upper stratae. They stood out more markedly because of the surrounding infiltration of reddish color.

Rhinoscopic examination revealed gelatinous greenish-yellow adherent pus underlying a complete covering of slightly yellowish crusts. On removal of this secretion mucosa appeared atrophied and pale. Septum was perforated anteriorly in the usual site for simple perforations. On the left side, just posterior to the perforation between lower turbinate and septum was a marked synechia. A slight one was also anteriorly present between middle turbinate and septum. Small superficial ulcerations of nasal mucosa were in evidence. Nothing abnormal was found about the sinuses. Slight pains about head and nose were complained of for brief periods.

Treatment. Nose was carefully cleansed of crusts and pus, cocaineized with a four per cent solution and painted over carefully with Iodo-glycerine solution. External ulcerations were treated with tincture of green soap and Peroxyde of Hydrogen. Iodo-glycerine was also applied and as a dressing a five per cent. boric acid ointment. Patient was placed on sat-sol. of K. I., thirty gttae, daily. Within two weeks she was able to leave the hospital, external lesions healed. Some tendency to seborrhoeic crusts, especially in depressions left by scars, remained about nose.

Adhesion between septum and turbinate being cut, was packed to prevent reappearing. Internal treatment of the nose was continued for five weeks and patient returned home cured.

Bacteriological reports from Prof. Timothy J. Leary, of Tufts Medical School, showed only staphylococcus pyogenes aureus on two cultures, one taken from nose, the other from an external ulceration. Another specimen analyzed by Dr. Rickard, of the Bacteriological Department of the Boston Board of Health, because glanders was suspected, showed staphylococcus pyogenes aureus and a diphtheroid bacillus of negative type, producing no change in sugar and was non-virulent when injected into guinea pigs.

Case II. Woman, aged forty-three years, first under my attention April 30, 1906. Had lost about thirty pounds in weight the past two years; had coughed during past two weeks. Examination of sputum negative as to tubercle. Had Otitis Media Sclerotica. Under treatment for general condition and ear trouble, improved considerably. Returned September 6, 1907, with peculiar nasal eruption similar to one described in Case I. Was accompanied by severe catarrh of the left side of nose. Having learned that she had been

bathing a dog frequently, with the mange, infection from this source occurred to me. Eruption was localized chiefly below the bony arch of nose, extending over onto right side, slightly onto cheek and into nostril. Two small ulcerations, one at junction of septum and lip, the other wholly on septum skin, being located below the mucous membrane, were especially painful. A deep red infiltration with small yellow points breaking down into ulcerations presented same kind of scar formation as in previous case, only smaller and more punctate near the junction of alae and cheek.

Rhinoscopic examination revealed thick crusts with greenish yellow muco-pus underlying. Nothing was observed about the sinuses. Exterior swelling was painful. Patient recovered after several weeks' treatment with iodides and antiseptic washes. November 16, 1908, observed scars marked without pigmentation and no reddening of nose. Nasal examination showed a synechia between inferior turbinate and septum.

Bacteriological examination by Prof. Leary showed staphylococcus pyogenes aureus only.

Case III. Man, aged thirty-five, attorney by profession, married, of good habits. Strong and robust physically. June, 1907, nose became stiff, glossy, red and inflamed on left side. Experienced difficulty in blowing nose and observed that crusts of muco-pus would come away.

Following an incident in October, 1907, when he got drenched in a rain-storm, the nose became more inflamed and an ulcer appeared on the inner side of left alae, extending from midway to almost tip of nose. He then began using various washes and ointments, mostly antiseptic in action, but with little effect.

In November, 1907, patient experienced severe pain in upper incisor tooth. Removal and replacement of fillings without relief, finally necessitated extracting tooth. Nose, after improving for some days, became worse than before.

In December, 1907, pain increased, causing patient loss of sleep. Pustules covering space between osseous arch and edge of alae from cheek to median line began to form on outside of nose. Occasionally one appeared on the right side. Hydrogen peroxide, Ichtholodine and various ointments, such as zinc oxid and mercury were employed for short periods, resulting only in removal of crusts tending to leave the nose soft and flabby. Pustules were punctured with bistoury as soon as they appeared. Nose was extremely painful, had entirely lost its shape, and possessed a fissure extending perpendicu-

larly from arch to edge of alae, which were swollen to twice normal size, surface deeply encrusted.

When first under my care, March 8, 1908, he presented a severely inflamed nose with a marked brownish crust adherent to several small underlying ulcerations. Nose was of intense dark red color, extending from above osseous arch to edge of alae and from about one-half inch past nasal line of cheek to beyond septum onto right side. Ulcerations presented same characteristics as in cases I. and II.

Internal examination of the nose indicated marked tendency to crust formation on left side and some on right. Owing to adherent muco-pus mucosa was peculiar whitish color. In spots there was slight tendency to ulceration.

Patient gave history of having treated a dog for skin trouble, probably eczema.

Bacteriological examination made by Prof. Leary showed staphylococcus pyogenes aureus.

Treatment. Crusts were removed by washing with Tr. Saponis Viridis, parts bathed in Corrosive Sublimate and Boric acid ointment applied. Internally nose was carefully cleansed and Iod-glycerine used. Within three weeks all pustules and pain had disappeared. Catarrh was most persistent after outer nose had healed. In May he was apparently well. In July a small fissure appeared on alae and redness returned. On blowing the nose blood was observed for the first time. Occasionally epistaxis would continue for one or two hours. Contractile collodion reduced redness. November, 1908, nose had resumed an almost normal contour, no epistaxis was present and patient entirely well.

Etiology. About the time the disease broke out two of my patients were engaged in treating an eczema, one on a dog, the other on a cat. Both felt they were infected from the source. The other patient had to do with the cleansing of surgical instruments. In all the same germ was found, namely, the staphylococcus pyogenes aureus. I believe the nose was first infected, but owing to the abundance of secretion, the skin near the muco-dermal line of the alae inside was abraded, allowing an entrance of the germs into the skin.

Symptomatology. Subjectively, the symptoms are most marked in the changed conditions predicted in the nose, namely those of stenosis, increased by the presence of crusts. The pain present is not that of a sinus trouble, but rather, acute, generally confined to inflamed area externally. Headache was a marked symptom in one

case. The outer nose always felt stiff, probably due to immobility of the alae.

Objective Examination. Externally the nose presents a rather severe type of inflammation, is markedly swollen and alae practically rigid. The skin is a dusky-red color from above osseous arch to muco-dermal line inside nasal vestibule and from a short distance beyond naso-buccal line to beyond median onto other side of nose. This infiltration may extend into and involve the lip as in Case I.

The second stage of inflammation is a papular condition. These are of good size, developing rapidly into pustules, which in turn break down to form ulcers, numbering generally from twelve to twenty and varying in size from a grain of rice to a dime. Though irregular in shape, they possess a tendency to be round or elliptical. The edges are slightly thickened, but not indurated, and the skin assumes a white color with the appearance of being parboiled. Ulcers probably do not penetrate the true skin. They are covered with a peculiar greenish-yellow tenacious pus, forming a yellowish-brown crust, which on removal presents a base of low red granulated tissue with no tendency to become exuberant and slight disposition to bleed.

The ulcers are most numerous along alae and its furrow, the largest appearing on or near the tip of nose. In Case I., ulceration occurred on lip between membranous septum and muco-dermal line, the largest ulcer involving latter.

The duration of these ulcers (in one case almost a year) is their most prominent peculiarity.

Internal examination of nose manifested thick yellowish crusts with greenish-yellow tenacious pus adherent to the mucosa. Mucosa was pale, marked with small reddish points of ulceration on septum and turbinates. In two cases synechiae were present between lower turbinate and septum. In Case I a perforation of the cartilaginous septum occurred at the usual site. A thorough examination for sinus involvement revealed nothing.

Pathology. Kaposi believes this disease to be an entity. Finger, in maintaining it to be of a tubercular nature, i. e. an acne lupus, is supported by Jarisch, also by Neisser and Judassohn in their book, and in a treatise by Ebstein and Schwalbe. With the exception of Finger and Kaposi, the writers have had no cases.

Lukasiewicz considered the tissue a granulation tissue. He sometimes found about the sweat glands a nodular infiltration of the sub papillary tissue. Infiltration consisted of mononuclear, epithelioid and numerous giant cells. No tubercle bacilli were found. Ani-

mal injections negative. Unable to assign it to any known group because of the participation of follicles he named it "Folliculitis exulcerans."

Finger, having excised a piece of inflamed tissue not reaching below sebaceous glands and including only superficial layers of infiltration, reports the following: Edematous infiltration of skin including papillae. Cells chiefly monocular and round, a few polynuclear appear in both diffused and localized foci surrounding in places a sweat gland duct in neighborhood of a small vein, thereby spreading connective tissue. Epidermis thick over inflammatory strata appearing infiltrated with polynuclear round cells, especially near edge of ulceration. Epithelial pearl formation present with points directly downward. Between upper epithelial layers small foci noted.

Bacteriological examination showed various bacteria, but no tubercle bacilli. Finger declares that histology frequently contradicts conditions supposed to be folliculitis. In a case of Dermatitis pyaemica due to acute endocarditis, small abscesses resembling a folliculitis condition appeared on skin. Histologically these were caused by staphylococcus thrombi located in capillary network of papillae. He maintained that everything histologically proven or clinically demonstrated coming from perifollicular connective tissue should be regarded as folliculitis. In almost all the cases a comedo acne was found showing disease of the sebaceous glands. Although in folliculitis exulcerans no primary involvement of sebaceous glands has been proven, this, however, seems concomitant, and appears to be the origin, owing to prevalence of sebaceous glands in nose. Finger does not consider that Lukasiewicz's case, not being entirely an affection of the glands, should be wholly classed in this series.

Kaposi did not examine his cases histologically.

Finger differs somewhat from Kaposi on general appearance of skin lesion.

Kaposi describes lesion as first presenting pea-size, blood-red, soft nodules with no special inflammatory border or presence of pain. Nodules necrosed and degenerated in toto without confluence and healed scars looked like a pustulous syphilide. On the basis of Lukasiewicz's histological examination, Kaposi thought he dealt with a granulation tissue, but was evidently wrong, as may be learned from Finger's case.

The latter describes his case as beginning with pin-point, rose-red nodules. About ulcerations and new nodules was a small inflamed border.

In addition to cases cited, I can find but six others. One of these reported by Lukaszewicz, appears doubtful. It is as follows:

Case I. Girl, twenty-four, attacked three months ago on lower legs with groups of moist, dark-red, pin-head sized abscesses, sustaining flat yellow crusts whose centers were slightly depressed and appeared as a nodule tending to enlarge to size of a cent or dollar. Crusts being removed, flat ulcers were found with moderately infiltrated borders and pale red granulations, which bled easily. No pain. Three months after entrance to hospital two subperiosteal thickenings developed, but healed spontaneously. Case lingered for months under careful specific treatment with injections of tuberculin and cauterization. Recurrences appeared in part about old places and on previously healthy areas.

Case II. (Kaposi.) Woman, twenty-eight, badly nourished, anæmic seamstress. Disease began two months previously as a red spot and developed into a pussy vesicle on tip of nose, spreading over alae and to bony arch. Inflamed area was covered with numerous small ulcerations varying in size up to a pea, and partly covered with red epidermis or a black crust. On the cheeks and knee were a few reddish brown papules covered either with crusts or smooth moderately raised soft nodules with same vesicles. Dark pigmented scars, some round and some long, were found on cheek, trunk and edge of forehead. Some acne varioliformis was present. After three months' treatment with paquelin cautery and plaster bands she was not cured.

Case III. (Kaposi.) Business man, thirty years old. The picture was the same without contemporaneous acne on face. Disease acute in onset. Nodules varied from barley grain to pea in size, half bullet shaped, brownish and thickly arranged, were not painful on pressure, but melted rapidly. Old crusts hid new crop. First stay in hospital one month. Recurrence three months later and patient returned for two weeks. Cured with cautery and curette.

Case IV. (Kaposi.) Man, forty years old. For four months had on end of nose an eruption extending up to bony arch and with recurrences on borders of necrotic round nodules. Simulated a syphilide with depressed scars. Curettage and cauterization used. Salicyclic acid soap and mercury found useless.

Case V. (Finger.) Man, a laborer, entered hospital October 22, 1900. Had had disease three months when first observed. Small itching nodule on tip of nose which had gradually developed as an ulcer. Patient derived no benefit from three months' treatment.

Disease spread and he came to hospital. He was well nourished, a trifle pale. On the edge of the right nostril was present an ulceration which included alae and filtrum of nose. It extended up to tip and inside the nose 1 cm. onto mucosa, involving also outer skin. Swelling occupied half of upper lip. Ulceration had an acutely inflamed, reddish border, finely dentated internally toward the center. Was covered with yellowish-brown crusts underlaid with large warty pus-covered granulations. On base of filtrum ulcers were located under alae of nose and on tip. Near the ulcers on right side and under alae, were found numerous pin-point nodules having on their apices a small-sized yellowish crust. Ulcers were fewer on left side. Skin elsewhere was fatty and shiny. Nodules had red, inflamed halo. Patient had considerable comedo acne. Granulations bled exceptionally easy. Boric acid unguent was employed. November 3, ulceration much flatter, suppuration diminished, edges still oblique, new scar tissue on ulcers about edge of alae filtrum, and near apex of nose. In the neighborhood were several new nodules whose apices broke quickly, forming by confluence a new ulcer. Increased boric acid to 4 per cent. and used 2 per cent. Ac. Carbolic in alcohol. November 20, ulceration of alae and upper lip healed. Edge of scar infiltrated for 1-2 to 1 mm. and rose-red color. Toward outside of recent infiltration are large pin-head sized, rose-red, inflammatory nodules, quickly forming yellowish crusts which leave behind small depressed scars when cauterized with nitrate of soda. December 7, last of nodules near osseous arch were cauterized. Infiltration gone.

Case VI. (M. Moller.) Woman, fifty-five years. Disease began on edge of nostril. In three months reached full development. Energetic specific treatment had no result. It attacked outer nose from edge of nostril to bony arch and extended into nose about 1 cm. onto mucosa. A nodule was prominent on left cheek, on chin and behind ear. Skin was markedly cyanotic, uneven and swollen by union of some small nodules coming from follicles. Exceptionally it developed into an acne pustule; as a rule it breaks down into an ulceration.

Differential Diagnosis. Kaposi states that the disease resembles clinically acne varioliformis and acne necrotisans in the destruction of tissue it produces, but can be differentiated from this by its localization on the nose, by the formation of sharp bordered and spreading nodules, histologically by the character of the nodules and the new formed granulation tissue.

The nodules, owing to their size, projection and histological characteristics, are like a luetic nodule, but on the whole it resembles a lupus nodule most in its course.

The histological findings are, however, against both lues and tuberculosis. No giant cells are present. The scarring is different, there being no pigment in the scars. From lupus and syphilis it is also distinguished by its rapid cure.

Finger states that it resembles acne teleangiectodes a great deal, but up to the present no such destruction and ulceration has been observed in this disease. He says dermatitis pyemica may resemble it histologically, but not in distribution or etiology.

Diphtheretic inflammation of the skin is very rare. It occurs generally on some wound and heals rapidly under antiseptic treatment. (Schucht.)

It resembles Granulosis Rubri Nasi in distribution, but this disease is characterized by the development of discrete brownish-red macules and small papules, which fade completely on pressure with a glass slide and leave no stain as one obtains in lupus vulgaris. It feels granular, hence the name.

The involvement of the nasal mucosa caused me to think of glanders as a possibility. Glanders may run a chronic course and have ulcerations about the skin of the nose. These differ markedly from the disease we have to deal with. The eruption consists of small superficial red and purulent variolous-looking pustules, which discharge a foetid, serous or sero-sanguineous fluid. The temperature is elevated in acute cases and accompanied by malaise, headache, chills, pain in the epigastrium. In the subacute cases it is difficult to diagnose at times. A generalized eruption over the body of small pustules and ulcerations on gums, fauces and pharynx, together with ulcerations in the nose and the finding of the *Bacillus Malleus* will clear up the diagnosis quickly.

The *Bacillus Malleus* under certain conditions may resemble the staphylococcus in stained preparations. The guinea pig test will clear matters quickly if resorted to. (Bevan.)

Prognosis. Generally good, provided treatment is properly executed. Without proper treatment disease has a chronic course, as may be seen from above histories. In all cases reported it ran for three months or more, in one, over a year. In cases described by Kaposi and Finger, nasal condition was overlooked, owing to severity of skin lesions. Scarring, however, is marked, but not as severe a type as is seen in lupus and other destructive skin troubles.

Shape of nose altered slightly. No tendency toward perforation of alae observed.

Treatment. In above cases various treatment had been adopted prior to my care.

To one, the X-ray was applied for six months without any apparent benefit. None had received treatment for nasal condition, except some mild douche, affording only temporary relief. Various unguents, such as Zinc Oxide, Mercury and Boracic Acid as a local application were used, all proving worthless in this condition. My treatment consisted of cleansing mucosa carefully of crusts and secretion, applying a four per cent solution of cocaine, then rubbing Iod-glycerine with the applicator into whole surface. Externally the crusts were removed with Tr. Saponis Viridis and parts washed with 1-1000 sol. of corrosive sublimate, causing slight pain. An application of four per cent solution of cocaine was necessary to render part anæsthetic before applying the Iod-Iod glycerine to individual ulcers. An ointment with five per cent Boric acid was kept continually on parts. Internally Iodide of Potash was administered on the theory that by producing Iodism all mucous glands would be flushed out. The Iodide of Potash alone proved worthless in one case, where no treatment had been tried on real source of trouble, namely, inside of nose. Ulcers in one case were epidermized in two weeks. Nose, however, may continue red for some time. In one case this was irritated by the wearing of a veil, a well known cause of erythema of nose.

After ulcers heal treatment should continue on nasal mucosa for two or three weeks, or until secretion discontinues. It is also necessary to cut any synechia that may be found, thus further prolonging treatment.

BIBLIOGRAPHY.

- BEVAN AND HAMBURGER: *Journ. A. M. A.*, May 16, 1902.
EBSTEIN AND SCHWALBE: *Handbuch. d. Prakt. Med.* Bd. iii, II Th. p. 156.
FINGER: *Wien. Klin. Woch.*, 1896, No. 25.
FORDYCE AND NEWBORN: *Journ. of Cutaneous Dis.*, Dec. 1905.
JARISCH: *Nothnagel's Spec. Path. u. Ther.*, Bd. xxiv, p. 799.
JUDASSOHN: *Verhandl. Deut. Derm. Gesell.*
KAPOST: *Arch. f. Derm. u. Syphl.*, 1894, Bd. XXVI; *Wien. Klin. Woch.* No. 10, Mar. 6, 1902.
LUKASIEWICZ: *Arch. f. Derm. u. Syphl.*, 1891, Bd. 79, H. 2.
MOLLER: *Hygiea*, 1895, No. 2.
NEISSER AND JUDASSOHN: *Krankheiten d. Haut.*
SCHUCHT: *Arch. f. Derm. u. Syphl.*, Bd. 85, p. 103, 1907.
No. 76 Commonwealth Avenue.

PATHOLOGY AND TREATMENT OF RECURRENT QUINSY.*

BY ROBERT C. MYLES, M. D., NEW YORK.

One morning about eighteen years ago a young woman whom I had previously treated for peritonsillar abscess sent for me. I could not visit her until late in the afternoon, and then found that she had suffered all day from the symptoms of acute quinsy. There was a peritonsillar abscess, which had relieved itself and was discharging from one of the crypts in the tonsil. There had been no symptoms of quinsy on the previous day.

On passing the probe through the discharging opening, I found a cavity with apparently firm organized walls. It was self-evident that an abscess could not have formed in so brief a space of time. I removed the tonsil, including its central basic capsule, and found a cavity about half by three-quarters of an inch, occupying the triangular space external to the central part of the capsule of the faucial tonsil. The walls of the cavity were firm, thick and covered with a glistening membrane. Under drainage, the cavity gradually shrank to a very small size, and remained as a part of the wall of the fauces.

The pathologic condition of this case was probably due to the retention on some previous occasion of decaying septic debris in the bottom of a lacuna. Some of this infected material, either by erosion or through lymphatic or venous channels, had penetrated the very thin capsule or fibrous investment sheath—which is the only barrier between the blind pouches of the tonsils and the cellular tissue of the triangular space—and formed an abscess there with its central necrotic area surrounded by a phagocytic wall. These walls did not collapse so that the cavity could become obliterated, because sufficient aperture and drainage were not made and maintained during the crucial time. The lack of a sufficiently free opening, either by rupture or incision, during the first few weeks after the acute attack is, in the writers opinion, the principal cause of the cold fistulous abscess cavities which are found so frequently associated with rapidly recurrent quinsies.

Theoretically we can partially account for the formation and maintenance of these persistent cavities by the mechanical action of the palato-glossus and the palato-pharyngeous muscles upon the triangular, cellular space external to the tonsil and inside the superior constrictor muscle. The author has noticed, in almost every case, that the cavity discharges from one of the lacunae through an opening quite a distance above its floor. This condition creates a reservoir which is imperfectly emptied by the action of the

*Read before the American Laryngological Association, Boston, June, 1909.

above mentioned muscles, while the median and external walls of this cul de sac are frequently separated by the movements of the tongue and pharynx. Since observing this case it has been my custom to look for these fistulous discharging cavities in all cases of recurrent quinsy. I have found them in nearly all the cases where the premonitory symptoms have been brief, and the formation of pus sudden. These cavities appear to be more frequently the result of inflammatory conditions than of any cystic formations in the neck. Their walls are thick and solid, and contain a heavy deposit of phagocytic material. Occasionally tubelike, diverticular cavities extend downward to the hyoid fossae, nearly to the beginning of the esophagus, or upward toward the region of the Eustachian tube.

I have seen cases where the fistulous tracts burrowed into the base of the tongue, high up into the soft palate or down to the hyoid fossae. Some cases seem to cure themselves spontaneously by a process of inflammatory obliteration, and this probably was the basis of the old belief that quinsy would return if opened with the knife. In some cases the tonsil has been enucleated by dissecting through the point of union of the tonsil with the margin of the mucous membrane the opercular or involucre fold, and then continuing the dissection with sharp or dull elevators around the sides and part of the base exterior to the capsule. The chronic inflammatory deposits make this procedure much more difficult than in the ordinary cases of diseased tonsils. I have always used the traction forceps and wire snare with extreme caution during the final part of the technique; yet on several occasions portions of the superior constrictor muscles have been removed with the mass, a large part of the external wall of the cavity remaining lower down.

The most satisfactory operative procedure consists of dissecting the tonsils from the pillars with sharp properly shaped knives, leaving enough of the capsule around the outlet of the tonsil-cavity to prevent adhesion across the space between the pillars, then removing the tonsil as deeply as possible with the traction forceps and snare. After this, remove with the author's excisor forceps all of the median wall of the cavity that may be represented by the basic capsule of the tonsil. The fistulous tracts that lead from the main cavity can be incised with a curved bistoury as far as may be safe. In the cases where the diverticulum extended down to the hyoid fossae, a seton was used to gradually cut through and convert the fistula into an open tract.

46 West Thirty-eighth Street.

**THE REPORT OF THE REMOVAL OF TWO PHARYNGEAL
TUMORS (FIBROMA AND LYMPHOMA) WITH
THE LIGATION OF THE EXTERNAL
CAROTID IN ONE CASE.**

F. PHINIZY CALHOUN, M. D., ATLANTA, GA.

The report of the two following cases of pharyngeal tumors, while interesting to the writer, is called to your attention for the following reasons:

1. Neoplasms of large size in the pharynx are not common.
2. The growth is usually slow, and should there be a recurrence after operation, it is usually rapid.
3. Ligation of the carotids is not usually practiced in their removal.
4. The loss of blood at the time of the operation, and the shock following, is usually severe without carotid ligation.

CASE I.—Master W., aged fifteen, had suffered from nasal obstruction for almost three years. He was a mouth breather, and his physiognomy and general build was that typical of a patient with adenoids. He was an inmate of the Deaf and Dumb Academy at Cave Spring, Ga., and was considered a pupil of only moderate intelligence. His father and mother were double first cousins, and there were three other children in the family who were mutes.

At my first examination, the boy was quite thin, anemic looking, and, as previously mentioned, a mouth breather. There was a constant muco-purulent discharge from both nostrils, and air could not be forced through the nose, either by inhalation or exhalation.

After the mucous membrane of the nose had been shrunk by a weak solution of cocaine and adrenalin chloride, an obstruction could be seen in both posterior nares. With a long probe this obstruction moved only a very little.

Looking into the mouth, a round glistening mass, slightly injected with a few blood vessels, were seen to hang below the soft palate on each side. They could be readily moved with a probe. With a small rhinoscopic mirror, the whole post nasal space was seen to be filled with multiple, rounded tumors, all springing from a common base, the superior and posterior walls of the pharynx. Introducing the finger behind the soft palate, these multiple tumors could be easily

felt, and by pressure, forcing the tumors out of place, the chonae were found well open. The whole posterior wall was much thickened.

A diagnosis of fibroma of the naso pharynx was made.

A small piece was snared for microscopic examination, and the report of the pathologist, Dr. Geo. S. Dixon, of New York, in brief is as follows:

"The growth is a fibrous polypus with endothelial proliferation, especially about the vessels. I do not think it is malignant, but the patient will bear watching."

The first operation was attempted without an anaesthetic, and a quantity of this hard, fibrous tissue was removed with a pair of volsella forceps and curved scissors. As the patient lost considerable blood, and was becoming weak, he was placed in bed, and after a few days, he was up and about, and was allowed to return to his home within a week. An examination of his naso-pharynx was made before his departure; and it was found by palpation and inspection, that only a small portion of the tumors had been removed. It was thought best to wait two or three weeks before attempting any other procedure.

One month later another examination was made, and there was little change, except that he was breathing fairly well through his left nostril. He was placed in the Wesley Memorial Hospital, a general anaesthetic (ether) was administered, and the entire pharyngeal wall cleaned of this neoplasm, first by a rough dissection with a pair of curved scissors, then using an adenoid curet, the smaller parts were entirely removed. The bleeding was profuse, and the shock profound, and it was not until late in the night that the patient was entirely out of danger. It was really the suddenness of the shock, or the bleeding into his own vessels that arrested the hemorrhage. I did not find it necessary to use a post-nasal plug.

After five days of absolute rest in bed, he was allowed to return home, in very good condition, with perfect nasal breathing.

One year later I examined him, and while his nasal breathing was still perfect, and the patient had gained greatly in health and strength, there was a recurrence of the growth in the right side of his naso-pharynx. I saw no indication at that time to interfere, and so advised his father. He is to report again within one year.

CASE 2. Mrs. G. R., age, thirty, a farmer's wife, came to the clinic of the college of physicians and surgeons, complaining for fifteen years of difficulty in swallowing, and of a choking sensation whenever she laid down. She had, herself, looked into her mouth five years ago with a looking-glass, and had discovered a tumor-like body in the region of her left tonsil. There was nothing in her family or past history to indicate malignancy. The woman was well nourished and had always been healthy.

The examination showed a large granular tumor attached to the lateral wall of the pharynx, posteriorly to a moderately hypertrophied left tonsil, extending almost as high as the soft palate, and as low down as the epiglottis, and toward the median line of the pharynx for about one-half inch. The base of the tongue was in contact with the growth, and it was evidently this contact that caused the difficulty in swallowing, and the irritation about the epiglottis, especially in the reclining position that caused the choking sensation.

A small piece was excised for microscopical examination which proved to be a lymphoma, according to the report of Dr. Claude Smith of this city. There was much bleeding from this small operation.

An operation was advised and the patient was placed in the Wesley Memorial Hospital. Dr. W. P. Nicolson was consulted as to the advisability of an external carotid ligation, and it was his opinion that it should be performed.

The left external carotid was easily ligated, and the proper neck dressing applied. Immediately following, a mouth gag was inserted and the tumor grasped with a large pair of Volsella forceps and snared in three sections with a Farlow snare. There was practically no bleeding, and the size of the three pieces removed was about that of a small hen egg.

The left tonsil was slightly hypertrophied and buried, and I thought it best at that time to remove it also. I went about it in my usual way, and removed it with a snare, when to my surprise, after the patient had been turned on her right side, face downward, I discovered blood gushing from her mouth. Upon examination, the hemorrhage was found to come from the operated tonsil. A gauze sponge held over the raw surface of the tonsil arrested the hemorrhage, but as soon as removed, the spurting recurred. A large abdominal clamp was used to catch up the tissues between the

pillows, which stopped this spurting, but the oozing was rather profuse. After a few moments deliberation, the tonsillar hemostat applied, and the patient returned to her ward in excellent condition. That night I kept the patient under the influence of an opiate, and the next morning the hemostat was removed. The following day, the clamp holding the bleeding vessel was also removed.

The case made a rapid recovery, and in ten days left the hospital. I have heard from the patient often, and there has been no recurrence so far as she knows up to this time, which is nine months after the operation.

My purpose in presenting these two cases is to illustrate the importance of carotid ligation in the removal of large tumors from the naso-pharynx. The procedure is a simple one, and rarely attended with risk.

In case one, that of the fibroid tumor, a double ligation of the external carotid would undoubtedly have caused considerable less bleeding, no shock and the chances for a recurrence of the tumor would have been very much less. My reason for not ligating the carotids is that the father seriously objected, and was willing for the patient to assume all risk.

Two similar cases operated upon in this city in years past by colleagues, with fatal results from hemorrhage, only substantiates my belief that a ligation is imperative. The removal of the tumor in case two, in which the carotid was tied, the lymphoma was attended with practically no hemorrhage, and the excessive bleeding from the tonsillar operation can only be explained by an anomalous tonsillar artery, a branch of the internal carotid, over supplied with blood from an external carotid ligation.

Candler Building.

**VOLUNTARY ASPIRATION OF A FOREIGN BODY INTO THE
BRONCHI, REMOVAL BY BRONCHOSCOPY.**

BY CHEVALIER JACKSON, M. D., PITTSBURG, PA.

At the Eye and Ear Hospital, of Pittsburg, I removed by bronchoscopy two tacks from a posterior branch of the right inferior lobe bronchus of a woman aged forty-one years, referred to me by

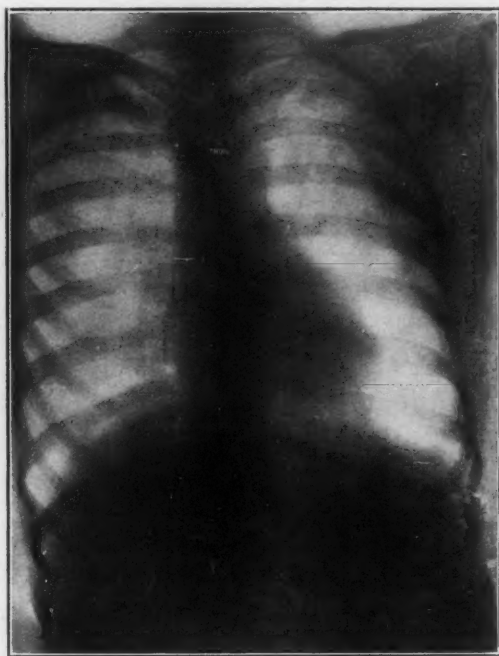


Figure 1. Radiograph by Dr. Lewis G. Cole, showing two tacks in a posterior branch of the right inferior lobe bronchus. Tacks removed by bronchoscopy through the mouth. (Reprinted from Journal Amer. Med. Ass'n, Sept. 25th, 1909.)

Dr. L. G. Cole, of New York City, who made the excellent radiograph, (Fig. 1). The anesthetic was ether, given by Dr. McCready. The bronchi were so full of pus that the patient nearly drowned in her own secretions. After the bronchoscopic removal of the pus the tacks,

(Fig. 2), were promptly removed, the first tack requiring one and one-half minutes and the second one two minutes, as timed by Miss Crock.



Figure 2. Tacks removed by bronchoscopy from posterior branch of right inferior lobe bronchus of a woman aged 41 years, referred by Dr. Lewis G. Cole. (Reprinted from Jour. Amer. Med. Ass'n., Sept. 25th, 1909.)

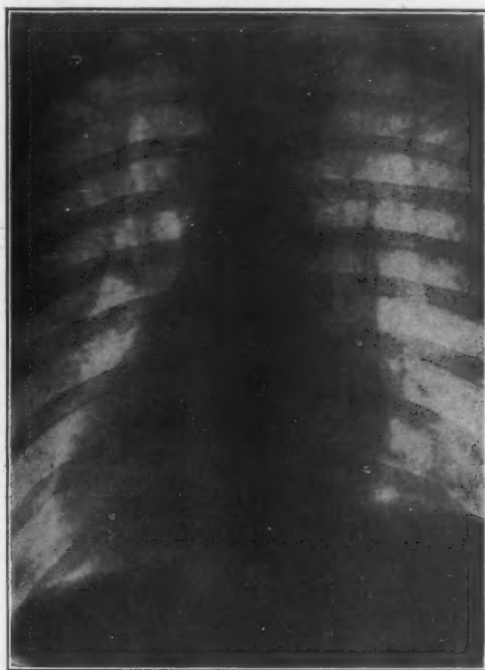


Figure 3. Radiograph by Dr. L. G. Cole, of tacks voluntarily aspirated by the patient.

At the operation I had the kind assistance of Drs. John W. Boyce, Homer McCready, Jesse Meyer (St. Louis), Richard Lewisohn (New York).

Four months after the removal of the tacks, as reported in the foregoing, the patient came to Dr. Cole's office at the suggestion of Dr. Geo. W. Bogart, stating that she had the same old symptoms, and she thought there must be more tacks there. She further said that the tacks Dr. Jackson took out were corroded, yet the last just coughed up was bright and new. A radiograph showed one tack on each side of the thorax, Fig. 3, not so near the periphery as

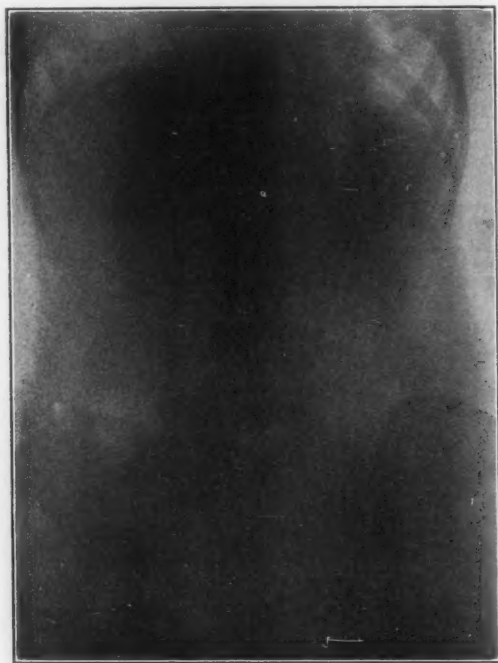


Figure 4. Radiograph by Dr. L. G. Cole, showing tacks in the intestines in progress of passing through. Tacks were swallowed by the patient in attempt to aspirate them.

the previous tacks. The question then arose how could the patient get the tacks into the bronchi voluntarily, as it was clear that she was a hysteric, if not demented. Dr. John W. Boyce, in consultation on this point, said that by throwing a number of tacks into the pharynx and taking a deep inspiration, she might get one or two down, but in so doing she would swallow many more than she

could aspirate, so that, if not too late, a radiograph would show tacks in the alimentary canal in progress of passing through.

An excellent radiograph by Dr. Cole showed four tacks in the abdomen, (Fig. 4.) I removed the tacks (Fig. 5) from the bronchi in the French Hospital of New York City with the kind assistance of Drs. Robert C. Myles, J. H. Abraham, John McCoy, T. Taylor and Geo. W. Bogart, the head being held in the Boyce position by Dr. D. E. Sable, and the anesthetic being skillfully administered by Dr. T. Drysdale Buchanan.

There was a most intense inflammation of all the bronchial mucosa and large quantities of pus were removed. The tack in a posterior branch of the right middle lobe bronchus was readily removed, requiring about two minutes, but the second tack in the posterior branch of the left inferior lobe bronchus was exceedingly difficult safely to remove. It was embedded in bleeding granulation tissue, and the point had perforated the opposite wall of the next larger



Figure 5. Tacks voluntarily aspirated. Removed by bronchoscopy through the mouth.

branch. After fifteen minutes' work I succeeded in disengaging the point and removing the tack.

Two radiographs by Dr. Cole immediately after the bronchoscopy demonstrated that no tacks remained in the thorax. The first two tacks had, no doubt, been accidentally aspirated while putting down oilcloth. The sympathy, the interest, the sensational features of the case, with the anesthetic evidently appealed to the neurotic temperament of the patient, and developed the hysteria which now is most troublesomely manifest in ways unnecessary to enumerate here.

The case is unique, in that it has never before been demonstrated that a patient could voluntarily aspirate a foreign body into the bronchi, and it teaches a valuable lesson, as to how to detect the occurrence by radiography of the abdomen in cases where an accident is denied.

Westinghouse Building.

**THE INTRA-NASAL FRONTAL SINUS OPERATION; THE
ACCESSIBILITY OF THE SINUS AND THE
PROGNOSIS OF THE OPERATION.***

BY THOMAS CHEW WORTHINGTON, M. D., BALTIMORE.

The frontal sinus and ethmoidal cells are too intimately associated clinically to describe diseased conditions and treatment of one without the other. Cases of frontal sinus disease which are remediable by intra-nasal operation may be classed under: (a), catarrhal inflammation of the mucous lining of the cavity, characterized by sero-mucous secretion; (b), purulent inflammation; (c), those cases in which the signs point to frontal sinus disease and which are relieved by freely opening the sinus, but in which no secretion is found either before or during the operation; in these cases the symptoms are probably due to congestion and to disturbances of air pressure within the sinus. I must furthermore call attention to the fact that in all of these cases whether purulent, mucous or in the absence of secretion, there may be more or less free opening giving vent to the secretions and entrance to the air, or there may be partial or complete obstruction. They may be different stages of one disease or each may follow a distinctly separate course with pain as the only and most constant symptom, especially in the obstructive cases.

If the radical intra-nasal operation for disease or obstruction of the frontal sinus were more frequently performed, the external operation would seldom be found necessary. I make this statement,

First, because of the ease and safety with which the diseased sinus can be entered and drained through the nose;

Secondly, because the operation under cocaine and adrenalin has the advantage of being almost without pain or bleeding;

Thirdly, because the results will compare favorably with the external operation without its resulting deformity; and

Finally, because the external operation can always be done where the intra-nasal operation has failed, or if urgency demands.

I have never seen purulency or obstruction of the frontal sinus without purulent or other inflammation of the ethmoidal cells, and this diseased process soon causes degeneration and softening of the cells about the fronto-nasal duct so that entrance into the frontal sinus is easy of accomplishment and perfectly safe within certain limitations. The cases which I exclude are those where the frontal sinus is abnormal as to size or location, rendering entrance from within an impossibility. In order to demonstrate the accessibility

*Read at the annual meeting of the American Laryngological and Otological Society at Atlantic City, June 3, 1909.

of the sinus I refer to radiographs Nos. 1, 2, 3, 4, 5, 6, 7, 8, taken from two cadavers with the instruments in the frontal sinuses (antero-posterior and lateral views), and showing the three different angular curettes, and the spoon curettes in position.

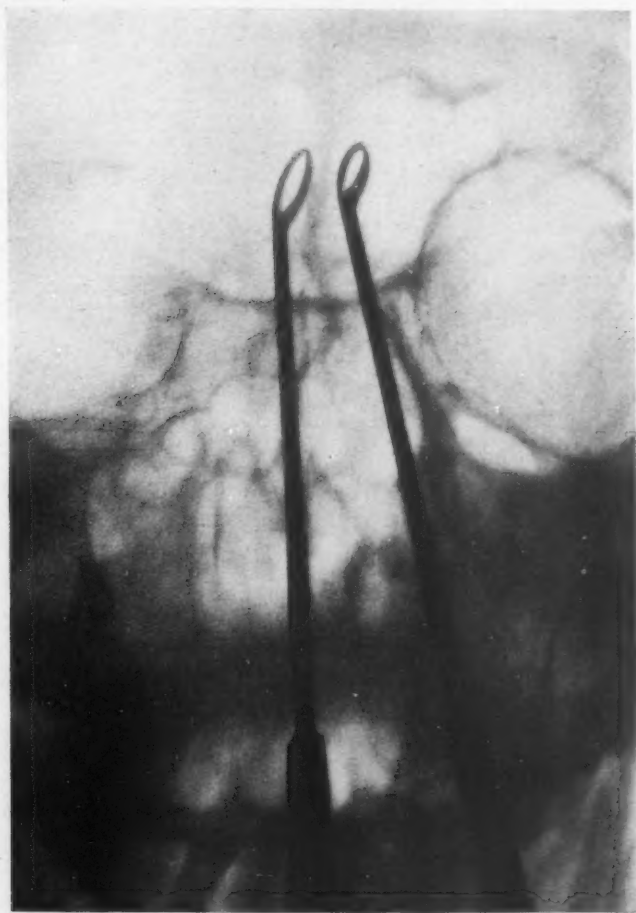


Fig. 1. Angular curette in right and left frontal sinus—Cadaver.

The frontal sinus operation should never be done either by the internal or external route unless every effort is made before or at the time of operation to eradicate all ethmoidal, sphenoidal or maxillary sinus disease, in order to lessen the possibility of reinfection of the

frontal sinus, either by the force of irrigations or in the effort to clear the nasal chambers in the use of the handkerchief.

Many rhinologists have for a long time been doing this operation; some almost identically as about to be described, and others by very different methods, but all with the same end in view and I believe with equally good results. In this connection it is therefore only necessary for me to mention several points in the operation which strongly appeal to me and to describe a few instruments which I have found particularly useful in accomplishing this work.

Unless the middle turbinate has a very strong attachment, I prefer making a cut in the neck of the bone with Holmes' scissors, or the Myles' thin straight cutting forceps and completing its removal by evulsion with Farnham's larger size grasping forceps. When the middle turbinate is very hard and strong, it is safer after the first cut to complete its removal with the snare. This uncovers a few anterior and especially the posterior ethmoidal cells and sometimes a part of the anterior sphenoidal wall.

By cutting or grasping forceps the posterior ethmoidal cells and the anterior sphenoidal wall are then removed as freely as may be found necessary, leaving the anterior cells until the last because of the occasional profuse hemorrhage from opening a large anterior ethmoidal vessel, an accident which interferes materially with locating the fronto-nasal duct. In the removal of these cells very little force should be used, especially about the region of the lachrymal bone, or the os-planum as it is not difficult to break into, or pull out important structures. For this part of the operation, I prefer sharp cutting forceps, straight or angular, as may be found necessary, with several angular curettes having straight and stiff handles. (Fig. a, b, c.) Then with a probe or one of the sharply-pointed angular curettes, the frontal sinus is entered and the operation of enlarging the opening through the fronto-nasal duct is completed with the same curette by passing it up as far as possible, close to the anterior wall of the sinus, and cutting downward and forward, and always in a vertical antero-posterior plane.

The opening can be made smoother and sometimes a little larger by rasps, right and left (Fig. d, e.), which I have had made and which are a modification of the instruments devised by Dr. Good for the same purpose. The frontal sinus can now be examined with instruments to a much greater extent than seems possible to one not working in this field.

I have performed this operation a great number of times in my private practice and on dispensary patients. I regret that I have careful records of only fifty-nine cases and it is these only which

this paper will comprise. These cases were all in the white race; twenty-nine were males and thirty were females; thirteen were between the ages of nine and twenty years; thirty-seven between twenty and fifty years and nine between fifty and seventy years.

The earliest age was nine and three-quarter years, the oldest was sixty-nine years. In five cases there was a history of less than one month's duration; in three, a history of less than one year; in forty-

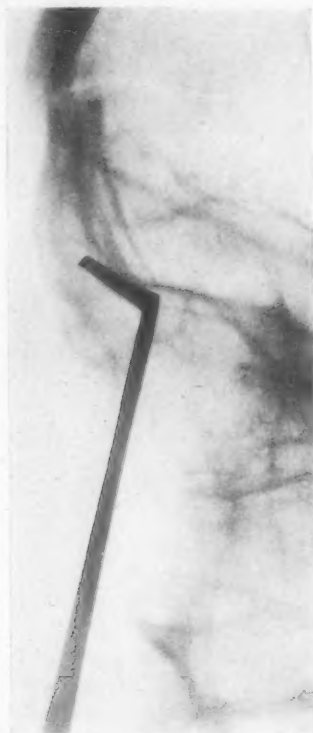


Fig. 2. Angular curette in left frontal sinus—Cadaver. Radiograph by Dr. Cotton, Baltimore.

six, a history of one to twenty years, and in five cases a history of twenty to forty years of catarrhal sinusitis. Pain was a prominent symptom in fifty-two cases. In seven there was no pain.

In thirty-four cases the frontal sinus contained pus, in seventeen the fluid was mucous or muco-purulent, and in eight there was no discharge which could be traced as coming directly from the frontal sinus, and which I have classed under heading "C."

In twenty-nine cases both frontal sinuses were opened intra-nasally, representing fifty-eight frontal sinuses; in fourteen the right frontal was opened; in twelve the left. In one case I failed to open the right, and in another the left, while in one of these latter cases its fellow was easily entered. In two cases or four frontal sinuses, I failed to enter either sinus. In one of these last mentioned cases (No. 23) I was able later to obtain a radiograph which shows absence of the frontal sinuses.

In 93 per cent of these cases, therefore, the sinus was accessible intra-nasally. In four cases a part of the inner orbital wall had been destroyed as a result of ethmoidal caries. In case 31, upon opening a large ethmoidal cell, the dura was exposed for perhaps half an inch in length; it appeared pink, glistening and pulsating, with fine vessels over the exposed surface. The intra-nasal operation was continued and the frontal sinus opened without interference with the dura. The patient, a man aged thirty-seven, who had suffered for ten years from multiple purulent sinusitis, made a good recovery.

Of the fifty-nine cases, only two were not relieved of pain. (Nos. 3 and 44.)

Forty-three cases are apparently well, eight are much improved, but not entirely well, three were lost sight of soon after operation; one had an external radical operation done and will be referred to later as No. 3; one was relieved for a time and will be referred to later as No. 29, and three cases ended fatally.

The first of this series of fifty-nine cases was operated upon in February, 1905, the last in June, 1908. In case No. 44, where I could not say with certainty that I had opened either frontal sinus (and therefore class it as unopened), I advised an external double operation which was declined and the patient was lost sight of.

In case No. 3, I thought the left frontal sinus had been opened, but the instrument had entered a high ethmoidal cell and the frontal sinus could not have been entered through the nose as was demonstrated at the time of operation, and before operation by a radiograph made for an eminent rhinologist in another city, to whom I had referred this patient in consultation, and who at the request of the patient and with my approval, opened the left frontal sinus from without in November, 1907. It is my duty to state that this patient has not been relieved of her discomfort by either the intra-nasal or the external operation.

Report of Cases of Special Interest.

Case 29 was a female, age sixty-four, with a history of nasal catarrh for forty years and referred to me by Dr. H. O. Reik. He

informed me that "her condition had been very precarious and indicative of serious brain trouble, probably cerebral tumor or abscess, and at a consultation it had been decided that she would not likely survive an external frontal sinus operation with general anes-

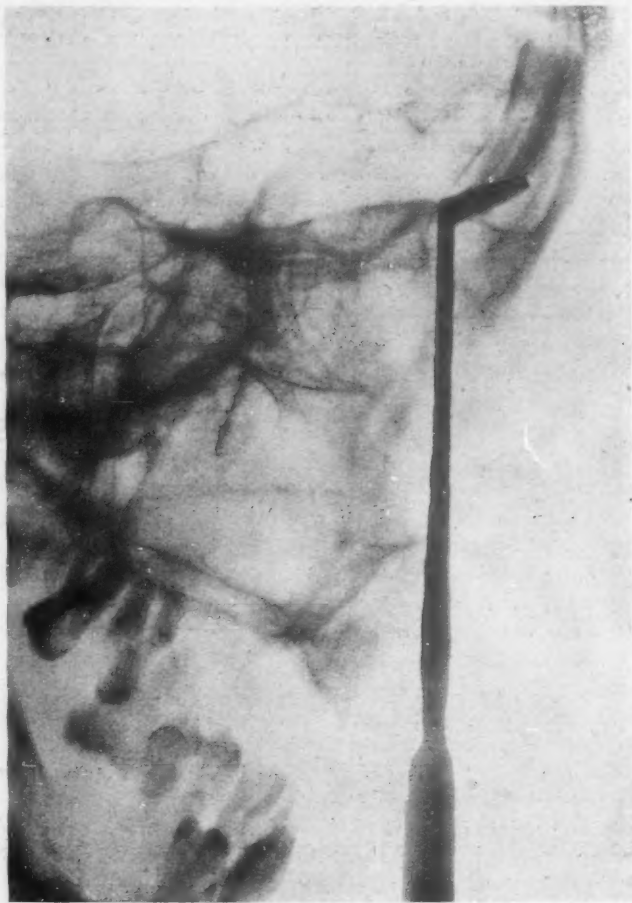


Fig. 3. Angular curette in right frontal sinus—Cadaver.

thesia." When I saw the patient with Dr. Reik, she complained of frontal pain, especially in the morning, dizziness, loss of memory, and great bodily feebleness. The diagnosis was bilateral chronic purulent pansinusitis with probably cerebral involvement.

Operation May 8th, 1908, under local anesthesia. All the nasal accessory sinuses were freely opened, including both frontal sinuses, all contained pus and were very large. Upon examination of the left frontal sinus the curved spoon curette came in contact with a soft, rounded surface about the posterior wall, corresponding to the supra-orbital notch, and it felt as though the wall of the sinus were absent and the instrument in contact with the dura. The left sphenoidal sinus was also badly diseased. The mucous lining of the sinus was partly detached.

The patient was seriously shocked, but made a good recovery and was much improved as to pain, memory, strength, and was in good spirits. She left the hospital for her home in a distant State about a month after the operation (June, 1908). Dr. Reik, on October 23rd, 1908, informed me that he had recently heard that the patient was slowly dying of brain trouble.

It is not at all probable that an external operation could have done more for her, as only one of an extensive character could have reached the trouble, and I doubt if she would have survived the shock of such an operation.

Of the three fatal cases, Case A (No. 6) was a female, age fifty-four, and was referred to me by Dr. Harry Friedenwald from the eye department of the Baltimore, Eye, Ear & Throat Hospital. She gave a history of nasa! trouble for 20 years, with constant and severe pain over the eyes and forehead, and especially over the right brow and in the right eye. Thick, purulent discharge from the nose. The eyes have of late swelled, especially the right upper eyelid, and at times there was confusion of thought.

Diagnosis: Chronic, purulent inflammation of the right fronto-ethmoidal sinuses. Transillumination gave right fronto-ethmoidal shadow. The operation was performed on March 23rd, 1906, under local anesthesia. The patient suffered from shock out of proportion to the operation. In the early morning of March 25th, she was in a state of coma and was aroused with difficulty. Death ensued on March 26th, at 1:30 a. m. Before death, a urinary analysis established a chronic nephritis. This case was evidently one of uremic coma induced by operation. I had not suspected other than nasal trouble, for the frontal sinus symptoms were so urgent as to overshadow every other consideration.

Case B, (No. 58), male, age thirty-six, referred by Dr. Thos. R. Browne, gave a history of headache and nasal discharge for a number of years with acute symptoms for three weeks following epidemic influenza. He complained of severe pain, particularly over the left frontal region and in the occipital region and said he could

not concentrate his thoughts. His temperature had been above normal for two weeks following acute influenza, but had been normal for ten days previous to the operation.

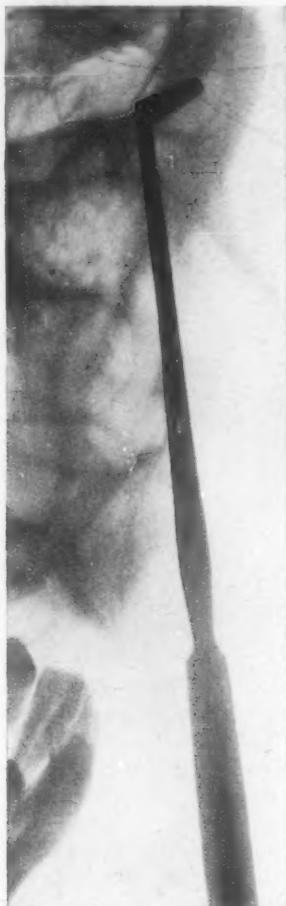


Fig. 4. Smallest size angular curette in right frontal sinus.—Cadaver.

The diagnosis was bilateral chronic purulent pan-sinusitis with acute inflammation following the influenza.

The operation on April 2nd, 1908, under local anesthesia, consisted in opening all the nasal accessory sinuses. They were very large and contained pus. The left sphenoidal sinus was full of

polyps, after the removal of which the mucous lining appeared to be absent, and the roof of the sinus rough and granular. Upon opening into the frontal sinuses the floor about the fronto-nasal ducts was soft and carious and many small polyps were removed. The patient appeared to be doing well until April 5th, at 11 p. m., when, after a slight chill, his temperature reached 105°. By 2 p. m., on April 6th, both eyes developed internal strabismus, and other symptoms of meningitis had developed. Pneumococci were found on lumbar puncture, in the spinal fluid. A decompression operation was done by Dr. Harvey Cushing on April 6th as a last resort. Death followed at 11 a. m., on April 7th.

Case C, (No. 41), female, age eighteen, gave a history of supra-orbital pain for a year, more severe on the left side, but was otherwise in good condition. The diagnosis was frontal sinus obstruction resulting from right middle turbinate hypertrophy, and on the left side carious degeneration of the middle turbinate and ethmoidal cells.

On June 8th, 1908, under local anesthesia, the anterior third of the right middle turbinate was removed by the snare. The left middle turbinate was removed by evulsion and with it a number of diseased ethmoidal cells. I was unable to pass a probe into either sinus and did not persist, as the case did not seem to demand more active measures.

On the morning of June 9th, the patient was very drowsy and complained of headache, more severe over the left brow, and at the base of the brain. The diagnosis of meningitis was soon established and was confirmed by lumbar puncture which showed pneumococci.

On June 16th, at 8 p. m., death occurred, two and a half hours after a lumbar puncture and the injection of pneumococcus serum.

I include this case in the series only because of the fatal termination, for the operation was simply removal of the middle turbinates and exposure of the ethmoidal cells, and did not involve the frontal sinuses.

These are the only fatal cases I have ever had in quite a large number of intra-nasal operations on the frontal, ethmoidal and sphenoidal sinuses. Inasmuch as many of my records are incomplete, as I have already stated, I have not included the other cases. It would not be proper therefore to draw a percentage of fatalities from the smaller number of cases reported in this paper.

In order to illustrate various types, I will report the following cases: Case No. 7, male, age sixty-four, gave the following history: For two weeks uncertainty of gait and dizziness; severe

throbbing pain in the left eye and over the brow, forehead, temporal region and root of nose and extending well over the head, most severe in the morning. Thick, yellow discharge from the nose and throat. This condition was ushered in with a chill, followed by fever and came on without known cause.

Diagnosis: Acute purulent inflammation of the left frontal sinus, secondary to a chronic inflammation of the other accessory sinuses

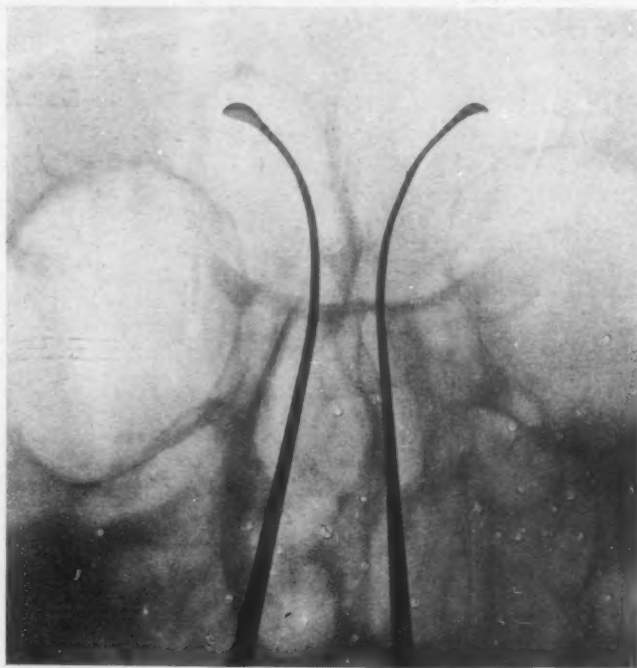


Fig. 7. Spoon curette in right and left frontal sinus—Cadaver.

of the same side. Transillumination gave a shadow over the left fronto-ethmoidal region.

On October 28th, 1907, under local anesthesia, the left middle turbinate and ethmoidal labyrinth were removed and the frontal sinus was freely opened, which was followed by a discharge of thick and very offensive pus. The relief from pain and supra-orbital tenderness was almost immediate. Owing to shock and the

Foot note: The Radiographs Nos. 5, 6, 8, 9, and 11, were shown, but their reproduction was not sufficiently clear, and they have therefore, not been printed with this paper.

profuse purulent discharge, it was necessary to defer the sphenoidal and maxillary sinus operations until November 11th, 1907. Both of these sinuses contained pus and showed evidence of chronic trouble.

The patient complained of frequent attacks of vertigo when lying down or in the erect position, for several months after the operation. By February, 1908, he was apparently well and has remained so to the present time, December 5th, 1908.

The next case illustrates very well obstructive frontal sinusitis. Case No. 35, male, age seventeen, was referred to Dr. H. O. Reik; he had been admitted to Dr. Reik's service at the Baltimore Eye, Ear and Throat Hospital, January 19th, 1906, with the following history: About six weeks ago, headache, steadily increasing, no sleep for a week, when the right eye and upper lid began to swell, the eyebrow and forehead became painful to the touch; there was nausea and vomiting; the patient could not sleep lying down.

Hospital Record: Eye pain, right optic neuritis, diplopia from paralysis of the right internal rectus. Temperature $99\frac{1}{2}^{\circ}$ to 101° , pulse 50 to 55; profuse night sweats.

On January 29th, 1906, when I first examined the patient, the external appearances were negative; the roof of the orbit and frontal region were tender on pressure. Transillumination gave shadow over the right fronto-ethmoidal region, the patient complained of pain, especially upon awakening every morning. The intra-nasal examination was negative, excepting a very indistinct drop of yellowish mucus between the middle turbinate and the outer wall, as though it had escaped from the infundibulum.

Diagnosis: Right frontal sinusitis, acute and obstructive.

Operation, February 23rd, 1906, under local anesthesia. Right middle turbinectomy and the removal of the ethmoidal cells with the anterior sphenoidal wall, and opening into the frontal sinus.

These sinuses contained purulent exudate; when the fronto-nasal duct was opened about a dram of thick, yellow muco-pus escaped from the frontal sinus, with immediate relief of the pain. He was perfectly well, including his eye trouble by June, 1906, and has remained so.

The case which I will next present is typical of obstructive non-purulent frontal sinusitis. Case No. 47, female, age forty, had had influenza in January, 1908. Since then no taste or sense of smell. No nasal discharge. A tight throbbing feeling about the root of the nose and across the eyes and forehead; headache, sometimes causing nausea; nose always dry, and compelled to breathe through mouth. Upon examination, both middle turbinates were found to

be tightly wedged between the septum and outer wall, and there was no secretion in either nasal chamber. The inferior turbinates were large and highly congested, but not entirely obstructive.

Diagnosis: Bilateral ethmoiditis with frontal obstruction.

Operation on June 9th, 1908, under local anesthesia. Bilateral middle turbinectomy, complete removal of the anterior ethmoidal

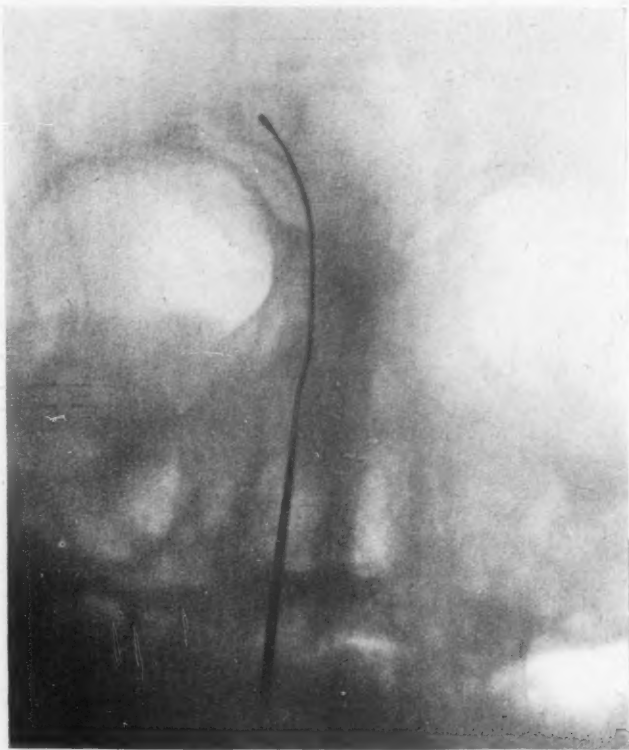
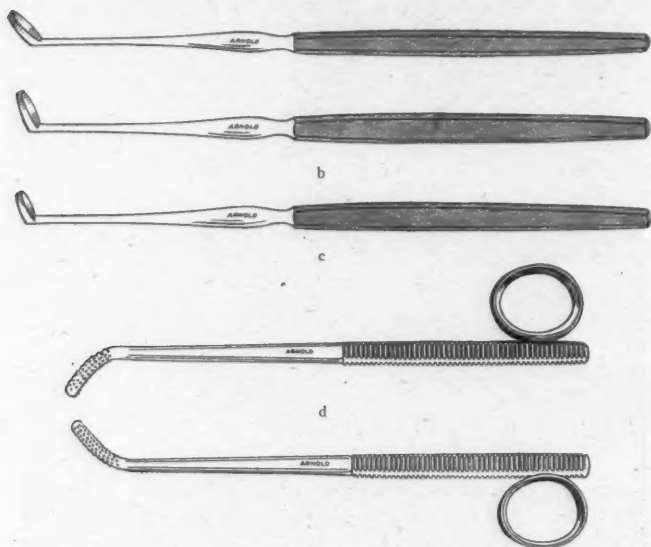


Fig. 10. First series of frontal sinus cases. Card No. 59. Probe in right frontal sinus.

cells and opening into both frontal sinuses, also bilateral inferior turbinotomy. The ethmoidal cells were very hard, thick and dry (almost brittle) and with no discharge or moisture coming from either frontal sinus. The relief from the pain and pressure symptoms after the operation was immediate and complete. The sense of smell or taste had not been restored at the time of writing this paper (December, 1908).

The intra-nasal operation requires no defense or argument, as the operation is too well established as an anatomical possibility and as a successful therapeutic measure. The prognosis is equally good, provided the work is done thoroughly and radically. This work is accompanied by difficulties and dangers and should only be done by the Rhinologist who has satisfactory hospital facilities at his command both at the time of operation and as long after as may be required for the establishment of convalescence.

The operation can almost always be done under local anesthesia. I have not been forced to use general anesthesia oftener than in two



cases of this series. This operation on the nasal accessory sinuses is neither so thorough or as safe under a general anesthetic as under local anesthesia.

I have found it better to complete the entire intra-nasal operation at one sitting. For instance, in a case of bilateral pan-sinusitis complicated by obstruction from deflection of the nasal septum, the submucous operation should be completed and all diseased sinuses opened before the patient leaves the chair, as there is very little more shock and much less danger of reinfection, when both nasal chambers are clean and the drainage good.

After the operation I have found it better to insert a light gauze dressing for twenty-four hours as the reaction is less severe and the

drainage much better, and secondary hemorrhage is controlled in this way. The most distressing post-operative complication which frequently occurs is inflammation of the trifacial nerve. This passes off in from one to two weeks with rest in bed and opiates.

Every fronto-ethmoidal case should be re-examined for granulation tissue for several months to a year following the operation.

I must not close without a word as to the permanency of the frontal sinus opening after operation. I have examined a great many of my cases, three, six, twelve months and three years after operation, and with few exceptions a large size probe or small spoon curette can be easily introduced into the sinus. To illustrate this fact, I refer to radiographs Nos. 9, 10 and 11, taken in November, 1908, from Case No. 59, in which I had opened both frontal sinuses in April, 1906. No. 9, an antero-posterior view shows the probes in both sinuses. No. 10, a lateral view, shows the probe in the right frontal sinus. No. 11, an antero-posterior view, shows the probe in the right frontal sinus. The instruments passed in with great ease.

CONCLUSION:

The object of this paper is to demonstrate by means of the cases published:

First, That the vast majority of cases of frontal sinusitis can be treated and relieved by the intra-nasal operation.

Secondly: That the cure is usually as complete and satisfactory as could be desired.

Thirdly: That the danger of the operation is no greater than when the external operation is done, since all which is opened and removed together with the ethmoidal cells in the intra-nasal operation must likewise be opened and removed quite as thoroughly in addition, when the external operation is done, if a successful outcome is to be looked for.

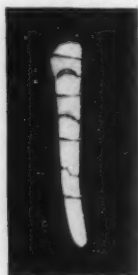
Fourthly: The dangers of the operation, whether done by the external or the intra-nasal methods diminish with the anatomical knowledge and operative skill of the operator in which the aid of skiagraphy is invaluable.

Finally: That the nasal accessory sinuses cannot ordinarily be drained as well by an external operation as by the intra-nasal operation.

Figure 1, a, b and c, the three curettes which I have devised for entering the frontal sinus.

Figure d and e, my modification of Dr. Good's frontal sinus rasps, right and left.

1022 Madison Avenue.



Styloid Process of Case Reported by Dr. C. W. Richardson (Natural Size.)



Elongated and Abnormally Placed Styloid Process—Radiograph—Natural Size. Case of Dr. C. W. Richardson.

These illustrations complement the paper of Dr. C. W. Richardson, of Washington, D. C., published in *The Laryngoscope*, Oct., 1909.

SOCIETY PROCEEDINGS.

AMERICAN LARYNGOLOGICAL, RHINOLOGICAL AND OTOLOGICAL SOCIETY.

Fifteenth Annual Meeting, Atlantic City, June 3d to 5th, 1909.

CHRISTIAN R. HOLMES, President.

ABSTRACT OF PROCEEDINGS.

DR. HOLMES, the president, in welcoming the guests, expressed in behalf of the society, appreciation of the honor of having in attendance upon the fifteenth annual meeting so distinguished a colleague as Professor Ottokar Chiari, of Vienna, who had come to this country for the express purpose of delivering the oration on laryngology. In presenting Professor Chiari as guest of honor, regret was expressed that his visit to America was of necessity so short, and the hope that at some future time he would be able to make a more prolonged stay.

PROFESSOR CHIARI, in response to the president's words of welcome, expressed his appreciation of the invitation, so cordially extended, to participate in the meetings of this society, a society whose members were among the most renowned laryngologists, rhinologists and otologists in the United States. In Europe, America was always thought of as the land of development of the individual. This development was known to be due to the population which sprang from the countries of Europe, and which represented only the most courageous men of the old world, those who were brave enough to come to a new land to make their home under new conditions. These immigrants were, therefore, those best qualified to bring about development in all things. The arts and sciences have reached such a high degree of development in America that this country bade fair to surpass Europe in this regard. For all these reasons it could readily be understood why he appreciated the invitation to come to this country to meet his American confreres and to see the work of the members of this society.

The Treatment of Cancer of the Larynx.

Professor Ottokar Chiari, of Vienna, reviewed the modern methods of treating cancer of the larynx, a disease which, before the in-

vention of the laryngoscope, was only superficially known and but seldom subjected to therapeutic attention.

Prophylaxis would be of some value if the cause of carcinoma were known. It might be stated, however, with great reserve, that continued irritation of the mucosa of the larynx (by excessive drinking and smoking for example), recurring catarrh, syphilis, and, finally, heredity, are to be considered as probable causes of cancer of the larynx. Prophylaxis should be directed against bacterial and protozoic cause of cancer, which has been extensively studied, but without result.

The various non-surgical methods of treatment were mentioned—Serum therapy, Roentgen rays, radium, the enzyme treatment with trypsin and amylopsin and fulguration. The ligation of the carotid according to Dawbarn's method was also mentioned.

Surgical methods alone have proved of value in the treatment of cancer of the larynx, these methods alone showing undoubted cures of long duration.

The early removal of intrinsic cancer of the larynx generally results in radical cure. Extrinsic cancers, on the other hand, which lie about the margins of the larynx, affect the lymph nodes much earlier and give, therefore, a much graver prognosis. Total extirpation of extensive intrinsic cancer with participation of the esophagus, in horny squamous-celled cancer, except when no metastasis lymph nodes are present, and in the very old, is not indicated.

The operations which come into consideration for the radical removal of cancer of the larynx are: (1) intralaryngeal extirpation; (2) thyrotomy; (3) partial and total extirpation of the larynx; (4) subhyoid, transverse and lateral pharyngotomy.

Intralaryngeal extirpation, according to the majority of writers, is indicated only for small circumscribed tumors upon completely movable cords. From the available statistics concerning the method it is seen that the operation is entirely without danger. No instance of death resulted from the operation, forty-six per cent recovered, but in thirty-three per cent there was recurrence.

Thyrotomy, according to the consensus of opinion of most operators, is indicated only when the cancer is small and circumscribed, when it involves the vocal or ventricular bands without prejudice to the motility of the vocal cords. If the arytenoid is immovable it is an indication that the cancer has spread to the deeper portions. Even when the arytenoid is not swollen a partial extirpation must be performed. A comparison of the statistics of different operators shows that since 1888 cure has resulted in fifty per cent of the

cases; since 1894 in fifty-two per cent. Recurrences since 1888 have developed in twenty per cent of the cases, and since 1894 in nineteen and one-tenth per cent. All operators report that the voice becomes good after the removal of one vocal band, and also after removal of the ventricular bands.

The most suitable cases for partial extirpation are those in which the cancer is developed upon the vocal bands and visibly retards their motility, without the presence of lymph node enlargement and without the pharynx being affected. Somewhat less suitable are the extrinsic cancers, which have their origin on the arytenoid or the aryepiglottic folds, and those cases in which one side of the larynx is wholly involved. Of the thirty-two partial laryngectomies performed by the author, one case remained cured for six years and was then lost sight of, another died six years and four months after operation from carcinoma of the neck; two of the relatively cured patients have lived for two years and four months, and two years and two months; two lived two years and eight months, then disappeared from observation; one died of pneumonia one year after operation, one died of diabetes one year after operation, and one died one year and two months after operation from a febrile disease. There was recurrence in fifteen cases.

Total extirpation of the larynx is indicated only when both sides of the larynx are affected. Many operators consider those cases only as operable where there are not many lymph nodes affected and these completely movable. Many believe that those cases of intrinsic cancer which grow through the thyroid cartilage and extend outwardly can hardly give any hope of radical cure. The completed operation leaves, as a rule, a connection between the wound opening and the trachea, so that the patient, even if he wears a canula, can blow air through the window of the canula into the pharyngeal and oral cavity. In order to give the patient vocal speech, a tube may be introduced, in three or four weeks, from the canula to the lower end of the pharynx and a reed may be placed in this tube. This instrument is known as the artificial larynx. It gives such discomfort, however, that the patient is generally content with the whispered voice. Gluck's operation for total extirpation of the larynx was described in detail by the author. So far as mortality is concerned, the results since 1895 have been better than in partial laryngectomy, and are next to thyrotomy. It surpasses all other methods as to recurrence, and as to cure it ranks next to partial laryngectomy and about half that of thyrotomy.

Subhyoid pharyngotomy, or subhyoid laryngectomy, is indicated for those cancers which involve only the entrance of the larynx. Such growths are generally located on the epiglottis alone, more uncommonly on the arytenoid or aryepiglottic fold.

Transhyoid pharyngotomy comprehends the median splitting of the hyoid bone and membrane hyoidea, permitting the edges of the wound to be held apart by strong retractors. In this way the passage to the larynx is claimed to be good.

Median pharyngotomy is a combination of transhyoid pharyngotomy and thyrotomy.

Lateral pharyngotomy, performed according to various methods, is suitable especially for carcinoma of the pharynx and tongue, and less so for cancer of the larynx.

The Physiology of the Nose and Sinuses, with Special Reference to the Functions and Importance of the Turbinated Bodies.

Dr. Henry J. Hartz, Detroit, Mich., presented this paper, which was illustrated by a number of lantern-slide pictures. The author called attention to the fact that the human olfactory organ is in a state of retrogression, and that only the lower human races have retained the acuteness of the sense of smell such as is present in the lower animals. The nose is connected with nearly all organs of the body by vasomotor paths, and may set in motion a variety of reflexes, being, at the same time, the recipient of as many from remote organs. It is most intimately associated with the lymphatic and the central nervous systems. The olfactory nerve serves with the nerve of taste in the gratification of the sense of taste, the volatile substances of food reaching the olfactory nerve by diffusion. The olfactory nerve, in conjunction with the branches of the fifth nerve, likewise constitute a protective mechanism, acting the part of sentinels at the entrance of the respiratory and alimentary tracts. The nasal organ and its sinuses contribute in an esthetic sense to the quality of the voice, imparting resonance.

The conception of the nose as simply a pathway for air and the seat of the special sense of smell is insufficient. The soft structures, the mucous membranes and the turbinated bodies are under the control of the vaso-motor centers, and through the action of its constrictors and dilators are capable of assuming different states of turgescence, according to the applied stimulus, whether of bacterial, thermal, or psychical nature. The soft structures, with the septum offer resistance to the inspiration long enough to afford time for supplying humidity and warmth, and for filtering the air. While

normally in a state of slight enlargement, they respond to variations of weather, the blood vessels being still more enlarged in cold weather, thus supplying heat, while in warm weather they usually contract. In dry weather the canaliculi and the plasma channels furnish moisture sufficient for the saturation of the air. The adaptability of the soft parts of the nasal structures, together with the tortuous architecture, favors the deposit of the foreign substances of the air, rendering the region of the lower air tract practically sterile.

The olfactory and respiratory regions of the nose are lined with mucous membrane, having a layer of ciliated epithelium, the surface of which is covered with mucus, in which dirt and bacteria become entangled and transported, by the ciliary wave, toward the choanae. The specialized cell activity, with phagocytosis and the bactericidal fluid of the plasma channels, is important for the integrity of the nose, nearly sterile conditions being maintained. Investigations show that in eight per cent of cases the nasal content was found sterile, only a few organisms being found in the remainder. Inspiration normally under negative air pressure, as proved by Mink, is completely saturated and of blood heat, and contains carbonic acid gas. It follows the path along the floor of the nose, there being no rarified air to deflect it upward. The expiratory currents are opposed by the lower turbinated bodies, which obstruct its exit.

Careful measurements by Mink revealed the fact that both middle and lower turbinated bodies maintain a positive air pressure of six millimeters of water in the naso-pharynx. When these bodies were reduced by cocaine the positive air pressure fell from eight to two millimeters of water. Mink seeks a physiological function in the turbinated bodies, more especially the lower, namely, that of assisting in the maintenance of a positive air pressure by the swelling of their spongy tissue, and further, that of aiding in the equalization of the amount of expired air in a given unit of time, irrespective of the size of the breath. Under vaso-motor control the turbinated bodies, with their erectile tissue, together with the tubercle of the septum, aid in regulating the lumen of the nasal channels for respiration.

The investigations of Kayser and Shutter show that there is but little difference, as far as moisture and heat are concerned, between the air inspired through the nose and that inspired through the mouth. The air of the mouth has a temperature of 32.2 degrees C., that of the nose 33 degrees C., while both cavities show a

humidity of 7/9—. Thus the usually accepted theory that the nose alone serves to heat and moisten the inspired air is not borne out by experiment.

The proximity of the sinuses to the olfactory apparatus aids in the perception of odors. In forced inspiration, branches of the main current of air was sent into the various sinuses and by diffusion reach the olfactory nerves.

The ventilation of the sinuses is influenced by the inspiratory air current of the nose; which, being negative in pressure, causes syphonage through the orifices. At the end of each inspiration, however, the negative pressure of air in the sinuses is equalized by a sudden inrush of atmospheric air. The expiratory currents are under positive air pressure, and thus the sinuses, like the entire air tract, undergo fluctuations of air pressure.

The Pathology and Treatment of Recurrent Quinsy. By ROBERT C. MYLES, M. D., New York City.

(Published in full in this issue of THE LARYNGSCOPE, Page 930.)

DISCUSSION.

DR. JOHN F. BARNHILL, of Indianapolis Ind., asked Dr. Myles if he would give, in closing his discussion, something more of the pathology in the cases mentioned. Since the adoption of the radical tonsil operation it had often been found that the capsule of the tonsil was so firm and dense that it would seem impossible, unless it were diseased and broken through, for the abscess to form outside the tonsil. He would like to know whether Dr. Myles believed the capsule to be diseased and broken through, thus allowing the bacterial products to pass through the crypts to the peritonsillar tissue.

DR. WENDELL C. PHILLIPS, of New York City, thought the condition described by Dr. Myles, if he understood the reader of the paper correctly, was fairly common. He had frequently observed cases in which chronic abscesses remained in and about the basic membrane of the tonsil and which continued to discharge for years, with occasional acute exacerbations in the form of peritonsillar abscesses. He recalled one case in which the pus accumulated every two or three days, wherein the patient himself learned to put his finger upon the base of the tonsil and squeeze out the mass of pus and broken-down tissue. Since beginning to do this the man had never had an attack of quinsy, though he had had one attack of an inflammatory process which involved the epiglottis and caused edema, and seemed to be of bacterial origin.

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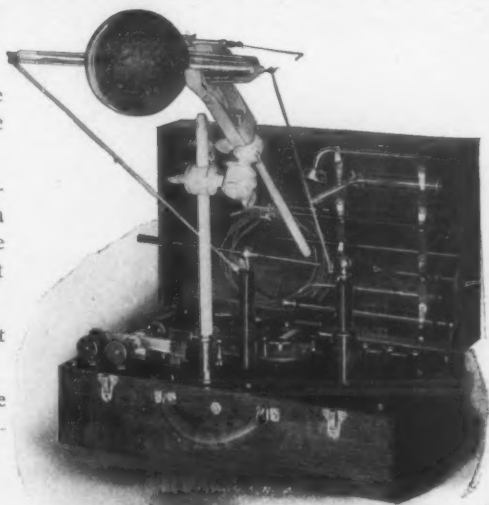
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NASAL DUCT STRICTURES.

H. MOULTON, Fort Smith, Ark., (*Journal A. M. A.*, October 10), advocates the use of lead styles in the treatment of nasal duct strictures, especially such as are resistant to other methods of treatment. The advantages of the material are, that it is cheap, easily obtained, pliable and readily shaped by the surgeon; comfortable to the patient, and not acted on by the secretions as are aluminum and silver in the course of time. He finds the fuse wire used by electricians the best adapted for this purpose. It contains a little antimony, which is rather an advantage than otherwise; can be obtained in different sizes, the best being those of 1, 1.5 and 2 mm. diameter; or the wire can be compared directly with the lacrymal probe. He gives directions as to the fitting and insertion of the style which are important, care being needed that it fit the canal without causing tension. After the first few hours, the patient is unconscious of its presence and the secretions readily find their way down along its side. It is well to remove the style every three or four weeks and see that all is well, but he has frequently allowed it to remain a month or longer, and in one case, it remained over six months with good result. As a rule, after a style has been worn a month or two, he takes it out for a week. Then, if syringing is at all difficult, he reinserts it for another month. The very old cases of tight stricture require the longer time for a cure. In no case is appropriate nasal or other treatment that may be required to be neglected. In his hands this treatment has been so uniformly successful that he hopes it will be more generally tried by other ophthalmologists. He does not claim to be the originator of the method, or advise it as a universal one, but thinks that it will be found effective in a large proportion of obstinate cases.

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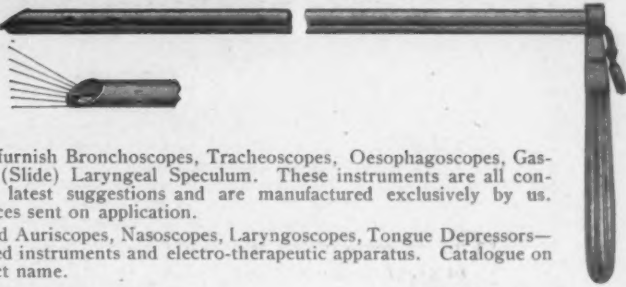
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and the various disorders of the breathing passages.

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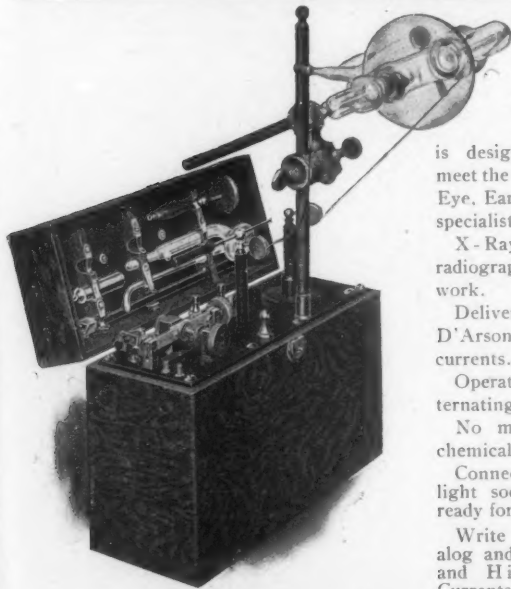
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Modern Pharmaceutical Remedies—Glyco-Thymoline.

Description: Glyco-Thymoline is a deep claret-colored fluid with the taste and odor of thymol and eucalyptol.

Formula: This preparation contains benzo-salicylate of soda, methyl salicylate from *Betula Lenta*, eucalyptol, thymol, pini pumilionis, glycerine and solvents. The alcoholic content is 4 per cent.

Action: A solution composed of Glyco-Thymoline one part, water three parts, approximates the alkalinity and salinity of the human blood, thus harmonizing with the secretions of tissues treated. When applied slightly warmed to the mucous membranes of the nose and throat it is soothing, solvent, mildly antiseptic, exosmotic and anesthetic. It promotes aseptic conditions and favors the restoration of normal functions of the mucous membrane. Internally Glyco-Thymoline is antacid, carminative, and anti-fermentative.

Uses: This preparation is recommended in the treatment of all catarrhal diseases of the mucous membrane, particularly of the upper respiratory, utero-vaginal and rectal tracts, as a solvent, soothing, antiseptic and alkaline wash. Internally it has been successfully employed to overcome gastric hyperacidity, gastro-intestinal fermentation, summer diarrhea of infants, etc. In obstetrical and gynecologic practice it has also proven useful. Its mild, non-irritating properties will suggest its use whenever and wherever an alkaline antiseptic solution is desired. In dentistry it has also been extensively employed.

Dosage: *Externally*—Glyco-Thymoline may be used in solutions ranging from 10 per cent to full strength. *Internally*—It may be used one-fourth to two teaspoonfuls in water as indicated.

Special Consideration: The selection and quality of the ingredients, the methods employed in their combination, the formula itself and the constant unvarying uniformity of the finished product.

L. Vernon Briggs, M. D., Boston, Mass., *Boston Med. and Surg. Jour.*, April 19, April 26, May 3, 1908.

J. C. Montgomery, M. D., Charlotte, N. C., *Charlotte Med. Jour.*, March, 1897.

W. R. D. Blackwood, M. D., Philadelphia, Pa., *Medical Summary*, March, 1905.

Prof. B. S. Arnulphy, M. D., Paris, France. *The Clinique*, Sept. 1897.

David Walsh, M. D., London. *Med. Press and Circular*, London, Jan. 4, 1905.

Seth Scott Bishop, B. S., M. D., D. C. L., LL. D., Chicago, Ill.

M. E. Chartier, M. D., Faculty of Paris, France, June 12, 1904.

H. McNaughton Jones, M. D., R. U. I., M. C. H., M. A. O., F. R. C. S. I., F. R. C. S., L. M. R. C. P. I., London, Eng., 3rd Edition, 1902.

Manufacturers: The Kress & Owen Co., New York City.

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4. Because our Pine Needle Oil (oleum cupressium Dacrydium) is the very best grade of imported Pine Needle Oil free from all the resins and irritating substances.
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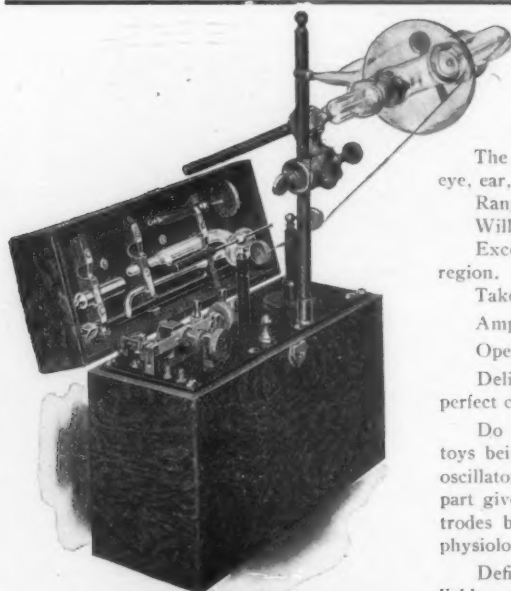
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PROVISIONAL PROGRAMME.

Sixteenth International Medical Congress, Budapest, Hungary,
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SECTION XV. RHINOLOGY AND LARYNGOLOGY.

REPORTS.

- Baurowicz (Cracow).—Therapy of Scleroma of the Upper Air Passages.
 Boumann (Amsterdam).—See Zwaardemaker.
 Bressen (Wiesbaden).—Hay-fever, Nervous Asthma, and Congestion of the Nasal Mucosa.
 Burger (Amsterdam).—Nasal Vertigo.
 Castex (Paris).—Operative Treatment of Malignant Tumors of the Nose and Pharynx.
 Chiari (Vienna).—The Diagnosis and Treatment of Carcinoma of the Larynx.
 Citelli (Catania).—Adenoid Vegetation.
 Denker (Erlangen).—Orbital Affections due to the Diseases of the Nasal Accessory Sinuses.
 Elcken (Freiburg i. Br.).—See Killian.
 Gluck (Berlin).—The Diagnosis and Treatment of Carcinoma of the Larynx.
 Grossmann (Vienna).—Nasal Asthma.
 Hajek (Vienna).—Diseases of the Ethmoid Labyrinth and of the Sphenoid Cavities.
 Heryng (Warsaw).—The Surgical Treatment of Tuberculosis of the Larynx.
 Killian and von Elcken (Freiburg i. Br.).—The Results of Bronchoscopy and Tracheoscopy.
 Kubo (Fukuoka, Japan).—The Surgical Treatment of Stenoses of the Larynx and Trachea.
 Luc (Paris).—Cranial and Intracranial Complications of Suppurations of the Frontal Sinus.
 Massel (Naples).—The Surgical Treatment of the Tuberculous Larynx.
 Moure (Bordeaux).—Operative Treatment of Malignant Tumors of the Nose and Pharynx.
 Sargnon (Lyons).—The Surgical Treatment of Laryngo-tracheal Stenoses.
 Schmiegelow (Copenhagen).—Primary Malignant Disease of the Trachea Treated by Resection of the Trachea.
 Schroetter (Vienna).—Therapy of Scleroma of the Upper Air Passages.
 Semon (London).—The Diagnosis and Treatment of Cancer of the Larynx.
 Uchermann (Christiania).—The Surgical Treatment of Stenoses of the Larynx and Trachea.
 Zwaardemaker (Utrecht) and Boumann (Amsterdam).—Experimental Photometrics from the Medical Standpoint.

PAPERS.

- Broeckaert (Ghent). Botey (Barcelona). Koschier (Vienna). Laurens (Paris). Raoul (Paris). Seifert (Wurzburg). Taptas (Constantinople). Zarniko (Hamburg).

SECTION XVI. OTOTOLOGY.

(Conjointly with the Eighth International Congress of Otology).

REPORTS.

- Alexander (Vienna).—Inflammatory Diseases of the Labyrinth.
 Biehl (Vienna).—Eiers' Hyperaemia in Ear Diseases.
 Botey (Barcelona).—To ligate or not to ligate the Internal Jugular in Thrombo-phlebitis of the Sinus Transversus.
 Brieger (Breslau).—The Value of Ligation of the Jugular in Otogenic Pyaemia.
 Bruehl (Berlin).—Hearing Tests and the Results of Anatomical Investigations in Otosclerosis and Nerve Deafness.
 Cheate (London).—Sclerosis of the Temporal Bone Resulting from Middle Ear Suppuration.
 Compaired (Madrid).—Diagnosis and Treatment of Purulent Intracerebral and Extracerebral Abscess of Otitic Origin.
 Delsaux (Brussels).—Variations in the Blood in Endocranial Complications of the Ear.
 Dench (New York).—Diagnosis and Treatment of Acute Otogenic Meningitis.
 Denker (Erlangen).—Anatomy of Deafmutism.
 Friedrich (Kiel).—Clinical data in Non-suppurative Diseases of the Labyrinth.

- Grazzi (Florence).—Conservative Medical Treatment of Chronic Otitis Media.
 Habermann (Graz).—Otosclerosis.
 Haug (Munich).—The Conservative Treatment of Chronic Suppuration of the Middle Ear.
 Heiman (Warsaw).—Otosclerosis.
 Jacques (Nancy).—Ear Infections in the Schools.
 Jearsley (London).—The Treatment of Chronic Non-suppurative Middle Ear Inflammation.
 Lermoyez (Paris).—Diagnosis and Treatment of Acute Otogenic Meningitis.
 Lombard (Paris).—Paralysis of the Motor Nerve of the Ear with Acute and Chronic Suppurative Otitis.
 MacNaughton-Jones (London).—The Prophylactic Treatment of Suppurative States of the Middle Ear, Anticipative of Indications for Radical Operations of any kind.
 Moeller (Copenhagen).—Chronic Progressive Deafness and its Classification.
 Moure (Bordeaux).—Justifiable Intervention in the Sinus of the Jugular Vein.
 Mouret (Montpellier).—Intra-cranial Extension of Infections of the Middle Ear.
 Panse (Dresden).—Histology of the Results of Hearing Tests.
 Pritchard (London).—Otosclerosis.
 Schmiegelow (Copenhagen).—Treatment of the Suppurative Labyrinth.
 Siebenmann (Basel).—Otosclerosis.
 Spira (Cracow).—Biers' Hyperaemia in Ear Diseases.
 Suarez de Mendoza (Paris).—The Indications and Contra-indications for General Anesthesia during Oto-rhino-laryngological Operations.
 Taptas (Constantinople).—Thrombo-phlebitis of the Lateral Sinus, of Otitic Origin.
 Tretrop (Antwerp).—Labyrinthitis.—Report on the Terminology of Otology.
 Uehermann (Christiania).—Consideration of the Prognosis and Treatment of Otogenic Sinus Phlebitis and Sinus Thrombosis.
 Wittmaack (Jena).—Diseases of the Auditory Nerve.

PAPERS.

- Baber (London). Baginsky (Berlin). Barkan (San Francisco). Botey (Barcelona). Broeckert (Ghent). Goerke (Breslau). Lake (London). MacNaughton-Jones (London). Moeller (Copenhagen). Moll (Arnheim). Panse (Dresden). Pritchard (London). Siebenmann (Basel). Snow (Syracuse). Spira (Cracow). Suarez de Mendoza (Paris). Thomson (London). Tretrop (Antwerp).



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NEWS ITEMS.

Dr. O. T. Freer, of Chicago, has been elected corresponding Fellow of the Danish Otological and Laryngological Society.

Professor Von Strumpell, of Breslau, has accepted the chair of medicine at Vienna recently made vacant by the death of Professor Von Schrotter.

Doctor John Gordon Wilson, of Rush Medical College, has been appointed professor of otology in the Northwestern Medical School to fill the vacancy occasioned by the resignation of Doctor Frank

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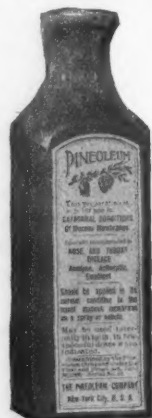
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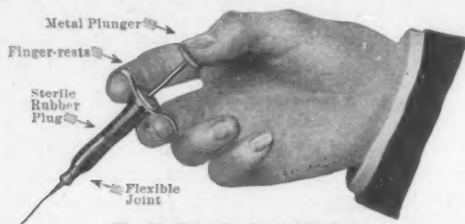
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Eucrapen, astringent and anesthetic, is one per cent beta eucain lactate in 1:5000 Suprarenalin solution. It is prepared especially for eye, nose and throat work, and for the convenience of dental surgeons. By applying Eucrapen locally or by injecting it, pain and hemorrhage are avoided and anesthesia is prolonged. Eucrapen is supplied in stable solution and in triturates by Armour & Company.

In all disorders of the respiratory tract in which inflammation or cough is a conspicuous factor, incomparably beneficial results can be secured by the administration of

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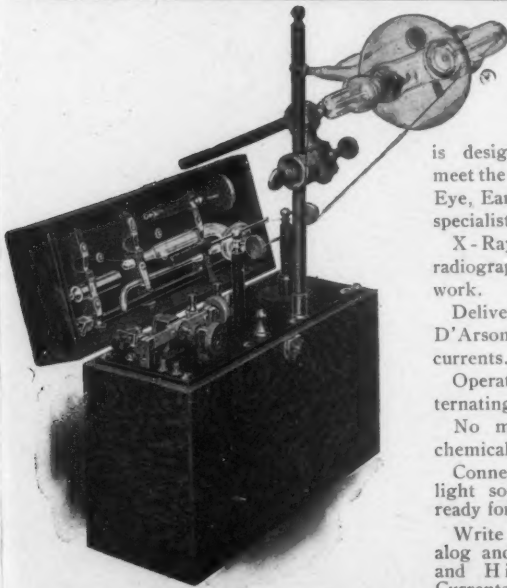
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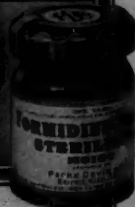


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